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COMMENTS ON THE TYPIFICATION OF LINNAEAN SPECIES OF *TRILLIUM* WITH DESIGNATION OF A LECTOTYPE FOR *T. ERECTUM* (TRILLIACEAE)

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ABSTRACT

Linnaeus proposed three species of *Trillium* (Trilliaceae) in 1753, of which two, *T. cernuum* and *T. sessile*, have been typified. Gleason designated a Kalm specimen (469.1, LINN) as the lectotype of the first name while Freeman selected a Clayton sheet (BM) as the lectotype for the second. A lectotype is here designated for the third name, *T. erectum*, it being a 1635 Cornut drawing. Linnaeus included several different species under each name he proposed. These are reviewed and their disposition noted.

KEY WORDS: *Trillium, T. cernuum, T. erectum, T. sessile*, Trilliaceae, nomenclature

Rendle (1901) was the first to address the original elements used by Linnaeus (1753) when the first three species of *Trillium* (Trilliaceae) were proposed. Rendle attempted to identify each cited element, but a combination of a lack of available types and recent changes in nomenclature call for a review.

Under *Trillium cernuum* Linnaeus, Linnaeus (1753: 339) cited Colden's (1749: 113) description, for which there are no known specimens, and a Catesby (1730: 45, t. 45) figure. Linnaeus also had a Pehr Kalm collection (469.1, LINN). Rendle (1901: 332) identified the plant in the Catesby figure as *T. catesbyi* Elliott. The Kalm sheet, he felt, was representative of *T. cernuum*. Gleason (1906: 390) subsequently designated (as "type") the Kalm sheet at LINN as the lectotype of the species. A duplicate is at UPS.

Trillium erectum was first named by Linnaeus (1745: 12; cited in 1753 from Linnaeus, 1749: 154), "Paris foliis ternis, flore pedunculato erecto", in a dissertation on the plants in the Burser herbarium (UPS). Burser had sent

a duplicate specimen to Bauhin who, in 1620, named it "Solanum tryphyllon Brasilianum"; later, Bauhin (1623: 167) called it "Solanum triphyllon Brassilianum". All three names were cited by Linnaeus in 1753 (p. 340). In *Species Plantarum* Linnaeus also cited Cornut's (1635: 166) name, "Solanum triphyllum Canadense", and figure (t. 167), along with its redrawing by Morison (1699, s. 13, t. 3, f. 7) who called it "Solano congener triphyllum Canadense" (p. 532).

From Kalm, Linnaeus acquired a specimen (469.2, LINN) he took to be *Trillium erectum*. This is a flowerless specimen of *Medeola virginica* Linnaeus, as Asa Gray later discovered when he examined and annotated the sheet. Smith (1817: under *Trillium*) had reported earlier that the specimen was not *T. erectum*.

According to Bauhin (1620: 91), his specimen "hoc in sylvosis Brasiliae apud Tououpinambaultios copiose reperitur, referent Pharmacopaeo Gallo, qui una cum aliis D. Bursero communicavit". Bauhin used "Brasilia" usually, but not always, for a location in southeastern Canada. The Burser specimen Linnaeus examined (*Herb. Burser* III:12, UPS) is *Trillium grandiflorum* Salisbury.

As little would be served by lectotypifying *Trillium erectum* on the Kalm specimen of *Medeola virginica* or the Burser herbarium sheet of *T. grandiflorum*, I hereby lectotypify the name on Cornut t. 167. 1635, the only authentic element of *T. erectum* as now circumscribed. Cornut said the petals were purplish black, and in the illustration they appear to be more than two centimeters in length. The leaves are not indicated to be streaked and are clearly more than four centimeters long and broad. I concluded that the Cornut figure represents what Scoggin (1978: 509) would call f. *erectum*. In my opinion, all formae within the species are of doubtful taxonomic significance.

Turning finally to *Trillium sessile* Linnaeus (1753: 430), the array of species included under this name was reviewed by Freeman (1975). Rendle (1901: 321) noted that the Gronovius (1739: 44) reference cited by Linnaeus was based on *Clayton 856* (BM), although this number appears only on the sheet and in the second edition of *Flora Virginica* (Gronovius 1762: 56). At first, Gronovius made no reference to a Clayton specimen, but did cite a Clayton phrase name in synonymy; this name is written on *Clayton 856*. I believe that "856" was added to the sheet after Clayton stopped supplying Gronovius with Virginia specimens. It is among a series of specimens not assigned numbers in 1739 but given numbers by 1762. I believe Linnaeus saw this sheet when he worked with Gronovius on *Flora Virginica* in the 1730s, and therefore it can qualify, in spite of its late number, as authentic material.

Clayton 856 was designated the lectotype of *Trillium sessile* by Freeman (1975: 11).

As for the other authentic material, Linnaeus (1753: 340) cited a Plukenet (1696: 352) polynomial and its accompanying illustration (Plukenet 1691: t. 111). Rendle (1901: 322) implied, and Freeman (1975: 11) repeated, that the

figure was based on a specimen in the Sloane herbarium (*H.S.* 90:95, BM-SL). In fact, the Plukenet figure is a copy of a drawing made by John Banister (original, BM). I suspect, however, that 90:95 is a Banister collection and may be regarded as a voucher for both the figure and Banister's own name published by Ray (1688: 1928). The specimen is *Trillium sessile.*

Linnaeus (1753: 340) cited another Catesby (1730: 50, t. 50) figure. Freeman (1975: 27) identified the plant as *Trillium maculatum* Raf. Linnaeus also had a Virginia specimen when he proposed *T. sessile*: *Clayton 536*, 469.3 (LINN); duplicate at BM. The plants on both sheets are *T. pusillum* Michx. var. *virginianum* Fernald, and represent the oldest known specimens of this uncommon plant.

Linnaeus had a broad species definition in many groups of plants, but that expressed in *Trillium* is greater than normal. Certainly the lack of material contributed to this, aggravated all the more by his inability to have all of the material together at one time for a final critical review as he was writing *Species Plantarum.*

This is important to remember when examining Linnaeus's original material. He accounted for many names proposed in the past, including ones he created himself based on specimens seen years before or knew from illustrations that were often dubious. He then applied those names, as best he could, to specimens he eventually obtained. Today, one can take out a flora or a recent monograph, spread out numerous specimens, and compare the proposed type with them. Linnaeus had no such opportunity.

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TYPIFICATION OF THE LINNAEAN SPECIES OF *ZIZANIA* (POACEAE)

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ABSTRACT

The two species of *Zizania* proposed by Linnaeus, *Z. aquatica* in 1753 and *Z. palustris* in 1771, are lectotypified on available elements. Application of the names for the wild-rices of eastern North America is not altered by this action.

KEY WORDS: *Zizania*, Poaceae, wild-rice, nomenclature

The genus *Zizania* consists of four species, the southern wild-rice, *Z. aquatica* Linnaeus, of eastern North America from Ontario and Quebec, Canada, southward to Florida and Louisiana; the northern wild-rice, *Z. palustris* Linnaeus, of southern Canada from New Brunswick to Manitoba south to New York, Minnesota, and Iowa; Texas wild-rice, *Z. texana* A.S. Hitchc., a narrow endemic in Texas; and Manchurian wild-rice, *Z. latifolia* (Griseb.) Turcz. *ex* Stapf of eastern Asia (Dore 1969).

When Linnaeus (1753: 991) proposed *Zizania*, he based the genus on two species, *Z. aquatica* and *Z. terrestris* Linnaeus. The latter is the Asiatic plant now known as *Scleria terrestris* (Linnaeus) Fassett; it was lectotypified by Fassett (1924: 159) on the Rheede figure cited by Linnaeus (as "based on", Art. 8.3; Greuter *et al.* 1988). This shall not be discussed further.

Linnaeus cited three synonyms when he proposed *Zizania aquatica*: Gronovius (1742, and thus indirectly *Clayton 574*, Virginia, BM, 2 sheets) and two works of Sir Hans Sloane (1696: 33; 1705: 110, t. 67). Linnaeus did not, contrary to Dore (1969: 17), examine either of the Clayton specimens now housed in The Natural History Museum (BM) simply because, as was Gronovius' practice, he sent Linnaeus a duplicate of *Clayton 574* (1119.3, LINN). Unfortunately, we have no direct evidence what Linnaeus might have considered *Clayton 574* (LINN) to represent as he never annotated the specimens (mounted on two sheets but assigned a single number by Savage, 1945). This means that the Clayton material cannot be considered authentic material because

(a) Linnaeus never saw the sheets at BM and (b) he failed to annotate the sheets at LINN. As for the Sloane references, the only authentic element is the Sloane figure (t. 67). The typotype (Stearn 1957) of this illustration, which was never examined by Linnaeus, is *H.S.* 2: 15, 16 (BM-SL). As reported by Hitchcock (1908: 132), the figure was drawn from a specimen of *Phragmites australis* (Cav.) Trim.

Nonetheless, Linnaeus did have an herbarium specimen at hand when he proposed *Zizania aquatica* in 1753. This is 1119.1 (LINN), an otherwise unattributed sheet except for "a sign" (Savage 1945: 171) the meaning of which is unknown. Dore (1969: 17) suggested the symbol represented Gronovius, but on what evidence this conclusion was reached is unknown; neither Jackson (1912) nor Savage (1945) mention it. I have not found the symbol on any sheet I can associate with Gronovius, and I doubt very seriously that 1119.1 is a sheet from Gronovius. The sheet was annotated by Linnaeus with a "1", the *Species Plantarum* number, and "aquatica", the specific epithet he used for the species.

Of the two authentic elements used by Linnaeus to establish *Zizania aquatica*, 1119.1 (LINN) and Sloane (1707, t. 67), I hereby designate 1119.1 (LINN) the lectotype. Although the specimen is thin stemmed and narrow leaved, its identity as southern wild-rice was confirmed by Dore.

The northern wild-rice, *Zizania palustris*, has had a somewhat checkered nomenclatural history. Proposed by Linnaeus (1771: 295) long after he established *Z. aquatica*, the initial assumption was that the two were but a single species. Michaux (1803: 75) took this view when he proposed the superfluous *Z. clavulosa* Michaux, as did Lambert (1804: 264) and Pursh (1814: 60) who, nonetheless, retained *Z. aquatica* as the correct name for the taxon. The rationale for Lambert's action was the close gross morphological similarities exhibited by the two critical specimens in the Linnaean herbarium, 1119.1 and 1119.2. As Hitchcock (1908: 124) would later conclude, both sheets were representative of the northern wild-rice.

All of this resulted in Smith (1819: under *Zizania*) opting to retain *Z. aquatica* for the North American element and to propose *Z. effusa* J.E. Smith for the plant Sloane had illustrated. When Linnaeus (1771) had proposed *Z. palustris* he referred, in synonymy, to a Patrick Browne (1756: 340) name. This, too, was included by Smith in his new species. Not mentioned by Smith in his publication is that he annotated 1119.3 (LINN) "effusa", making what I believe to be *Clayton 574* authentic material as well. Because Smith gave the distribution of his new species as "Common in all of waters, or lagoons, of Jamaica", and his description does not fit *Clayton 574*, I hereby lectotypify *Z. effusa* on the cited Sloane figure (1707: t. 67) rendering the name a synonym of *Phragmites australis*. Fassett (1924) and Dore (1969) made no mention of this species, and Hitchcock (1950: 980) attributed the name, incorrectly, to Munro (1862: 52).

As to the type of *Zizania palustris*, the only authentic element found is 1119.2 (LINN), the sheet annotated "Zizania" and "H U" by Linnaeus. This caused Hitchcock (1908: 124) to remark that no specimen in the Linnaean herbarium was identified with the species. Fassett (1924: 127), following Hitchcock (1906: 210) referred the specific epithet to *Z. aquatica* var. *angustifolia* A.S. Hitchc. without typifying the name. Dore (1969: 18) considered 1119.2 to be a "type" and a "classical specimen" (p. 19) of *Z. palustris*; I hereby specifically designate 1119.2 the lectotype of the name.

Typification of the two Linnaean names does not alter their current circumscription.

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NOMENCLATURAL CHANGES IN CALIFORNIA *MONARDELLA* (LAMIACEAE)

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ABSTRACT

Nomenclatural changes are proposed for several California *Monardella*. *Monardella undulata* Benth. var. *frutescens* Hoover and *M. odoratissima* Benth. var. *follettii* Jeps. are elevated to species status; *M. benitensis* Hardham is reduced to **M. antonina** Hardham subsp. **benitensis** (Hardham) Jokerst; and *M. douglasii* Benth. var. *venosa* (Torr.) Jeps., *M. villosa* Benth. var. *franciscana* (Elmer) Jeps., *M. villosa* var. *globosa* (E.L. Greene) Jeps., and *M. villosa* var. *obispoensis* Hoover *in* Jeps. are recombined as subspecies. The relationships and identification of these taxa are provided.

KEY WORDS: California, Lamiaceae, *Monardella*, taxonomy

Nomenclatural changes are proposed for several California *Monardella* that will be included in the forthcoming *The Jepson Manual: Higher Plants of California*, being prepared at the Jepson Herbarium, University of California, Berkeley. Changes include elevating two varieties to species status, reducing one species to a subspecies, and changing four varieties to subspecies. Each change includes a brief discussion regarding relationships and identification.

1. **Monardella antonina** Hardham subsp. **benitensis** (Hardham) Jokerst, *comb. et stat. nov.* BASIONYM: *Monardella benitensis* Hardham, Leafl. W. Bot. 10(13):239. 1966. TYPE: UNITED STATES. California: San Benito Co., along Clear Creek in asbestos-type serpentine soil, 11 July 1965, *Hardham 12672* (HOLOTYPE: CAS!; Isotype: US).

Monardella benitensis is considered a subspecies of *M. antonina* because of the characters they share and relatively minor differences in growth habit,

leaf habit, and stem and foliage vestiture that separate them. Both subspecies occur in the northern South Coast Ranges. These perennials have recurved outer bracts that resemble the leaves in color, texture, and vestiture; upright, leafy tipped, more leathery bracts of the middle series; verticillasters < 1.5 cm wide that are conspicuously glandular punctate and glandular hairy; ash colored, lance-ovate, leaves that are occasionally remotely serrate; and pale to deeply colored, lavender corollas.

The matted, low growing subsp. *benitensis* rarely exceeds heights of 6 dm; the pubescence of the stems and leaves is dense, shaggy, and spreading, and obscures punctate glands of the leaves; the leaves are generally folded when unpressed. The upright, openly branched subsp. *antonina* generally exceeds 6 dm; the pubescence of the leaves and stem is short, is ascending or appressed, and generally does not obscure the punctate glands on the flattened leaves.

Subspecies *benitensis* is restricted to barren, asbestos type serpentine of the Diablo Range, San Benito County. Subspecies *antonina* occurs on arid, exposed rocky sites on various geologic formations throughout the central portion of the South Coast Ranges from eastern Contra Costa Co., south to Monterey Co. Occasional populations of *Monardella villosa* from arid locales in the northern South Coast Range have conspicuously glandular, ash gray foliage; shorter, more compact hairs; and upright middle bracts are morphologically intermediate with subsp. *antonina* and may have hybrid origins.

The bract morphology and appearance of the diploid *Monardella antonina* implies a close relationship with the tetraploid *M. villosa*. The vestiture of subsp. *benitensis* resembles that of the tomentose forms of *M. villosa* described as varieties *subserrata* (E.L. Greene) Epling and *tomentosa* (Eastw.) Jeps., leading Hardham (1966a) to conclude subsp. *benitensis* may have provided the genetic stock for tomentose forms of *M. villosa*.

The tomentose forms of *Monardella villosa* should not be considered as subspecies because a graded series from sparse villous to tomentose plants can be found in *M. villosa* populations of the North Coast Ranges and Sierra Nevada foothills. Villous plants generally occupy protected, mesic, wooded localities, while forms corresponding to subspecies *subserrata* and *tomentosa* occur on arid, rocky sites, often only meters from sparsely villous forms.

2. **Monardella frutescens** (Hoover) Jokerst, *comb. et stat. nov.* BASIONYM: *Monardella undulata* Benth. var. *frutescens* Hoover, Leafl. W. Bot. 10(11):179. 1949. TYPE: UNITED STATES. California: San Luis Obispo Co., north edge of Santa Maria Valley on Arroyo Grande-Guadalupi Rd., in sandy field, 10 July 1947, *R.F. Hoover 7289* (HOLOTYPE: OBI!; Isotype: CAS!).

Morphological and habitat features suggest that *Monardella undulata* var. *frutescens* should be elevated to species status. Morphological characters, over-

lapping distributions, and occurrence on coastal sand dunes suggest a close relationship among *M. frutescens, M. undulata*, and *M. crispa* Elmer.

The perennial *Monardella frutescens* closely resembles the annual *M. undulata* of sand dunes along the immediate coast and those just inland in coastal sage scrub. *Monardella frutescens* is generally over 4 dm tall and has few secondary branches from the main stem. *Monardella undulata* is typically many branched near the base and rarely exceeds 4 dm. Problems arise in separating herbarium specimens because *M. frutescens* can flower the first growing season after germination (Hoover 1949), when plants closely resemble the annual species. Multiple samples and population wide study may be required to ensure proper identification. *Monardella frutescens* occurs along a 40 mile coastal strip in San Luis Obispo and Santa Barbara counties, whereas *M. undulata* ranges from Marin County, south to Santa Barbara County.

Although similar in geographic range, habitat, and morphology, *Monardella crispa* and *M. frutescens* are easily separated. Both perennial species are denizens of central California coastal dunes. Each has undulate, hairy leaves and many flowered verticillasters with rose-purple or lavender corollas. Complications in separating *M. crispa* and *M. frutescens* arise because they are sympatric throughout most of their ranges and appear to hybridize freely. Although the two species occupy different types of dune habitat and are distinguished by a suite of morphological characters, morphologically intermediate plants do occupy disturbed sites and some natural habitat transitions.

Monardella frutescens occurs on stabilized sand dunes of the immediate coast and coastal terraces in a species rich dune flora with relatively modest vegetative cover. In contrast, *M. crispa* is strictly confined to sparsely vegetated, unstabilized, or active dunes most frequently encountered along the immediate coast. Relatively constant winds and shifting sand characterize its habitat and limit the variety and cover of plant life. The pattern and range of morphological intermediacy at some sympatric populations indicate extensive introgression. Field observations have revealed that morphologically intermediate plants occupy partially stabilized dunes with plant cover and species richness intermediate between that associated with the two parental forms. Intermediates also frequent roadcuts and other disturbed sandy habitats and can outnumber pure, unhybridized plants.

Identification of these three species is aided by noting the variation in taxonomically important characters throughout the population and the type of dune habitat. Field observations should be interpreted in light of the fact that intermediates between *Monardella crispa* and *M. frutescens* occupy natural habitat transitions and disturbed sites. The trio of crisp leaved, coastal dune *Monardella* can be separated using the following key:

Key to the Crisp Leaved Coastal *Monardella*

A. Annual; plants low, compact; often many branched below, leaf blades generally longer than internodes; stem glabrous or sparsely villous. ... . *M. undulata* Benth.

A′ Perennial; plants upright, openly and sparingly branched; leaf blades generally shorter than internodes; stem sparsely to densely puberulent. . B

B. Plant compact, eventually with numerous, crowded stems forming mounds > 1 m across; stem matted white tomentose, green epidermis obscured; leaves oblanceolate, thick, fleshy, whitish from dense, minute puberulence; head generally > 1.5 cm wide; bracts generally 7-15 mm. ..... *M. crispa* Elmer

B′ Plant upright, openly branched with one or few main stems, not mound forming; stem sparsely tomentose, greenish purple epidermis visible; leaves linear to narrowly lanceolate, thin, green, nearly glabrous to thinly villous; head generally < 1.5 cm wide; bracts generally 6-10 mm. ..... *M. frutescens* (Hoover) Jokerst

Sympatric populations of *Monardella frutescens* and *M. crispa* occur throughout the geographic range of the more narrowly distributed *M. crispa*. Historic collections place the northern range limits of both species near Oceano, southern San Luis Obispo County. Both occur intermittently along the coast south for 30 miles to Surf, the type locality of *M. crispa*. *Monardella frutescens* ranges south an additional 10 miles to near Point Arguello. A collection (*Hickson 41* [CAS], 31 Mar 1988) with morphological traits intermediate between the two species indicates that both have occurred at or near Point Arguello.

Monardella frutescens is the only taxon that can presently be located at Surf, leading to questions regarding the true nature of the *M. crispa* holotype (Smith 1982). My examination of the holotype indicates that it is representative of the more northerly *M. crispa* populations such as occur at Point Sal, Oso Flaco Lake, and the Guadalupi and Pismo Dunes. The bracts and flower heads of the *M. crispa* holotype are at the extreme low end of the morphological range for the species, but its low, unbranched habit, woolly stem and leaf vestiture, and broad leaf clearly distinguish it from *M. frutescens*.

3. Monardella douglasii Benth. subsp. venosa (Torr.) Jokerst, *comb. et stat. nov.* BASIONYM: *Monardella candicans* Benth. var. *venosa* Torr., Pacific Railroad Report (Whipple Exp.) 4:123. 1856. *Monardella douglasii* Benth. var. *venosa* (Torr.) Jeps., *Fl. Calif.* 3:443. 1943. TYPE: UNITED STATES. California: Yuba Co., plain of the Feather River near Marysville, 25 May 1854, *Bigelow s.n.* (HOLOTYPE: NY!; Isotype: GH!).

Monardella douglasii Benth. var. *parryi* Jeps., *Man. Fl. Pl. Calif.* 884. 1925.

This combination is required because subsp. *venosa* is a morphologically defined geographic entity with close affinity to subsp. *douglasii*. The two subspecies are morphologically identical, differing only in quantitative aspects and geographic range. They both have bracts with the lateral veins perpendicular to the midrib and silvery translucent tissue in areas between the bract veins. Subspecies *venosa* is distinguished from subsp. *douglasii* on quantitative morphological characteristics and geographic range. Subspecies *venosa* of the Sierra Nevada and Cascade foothills in Butte, Yuba, and Tuolumne counties has verticillasters over 2 cm wide, with broadly ovate bracts over 1.5 cm long. Compared with most *Monardella*, the bracts of subsp. *venosa* are disproportionately large relative to the verticillaster. Subspecies *douglasii* of the North and South Coast Ranges, has verticillasters less than 1.5 cm wide, and lance-ovate bracts less than 1.5 cm long.

Subspecies *venosa* has been considered extinct (Smith & Berg 1988). Historic collections are known from four localities: one each from near Chico and Cherokee in Butte Co.; the type locality on the "plain of the Feather River near Marysville," Yuba Co.; and the most recent collection taken in 1935 near Copperopolis, Tuolumne Co. (*J.A. Rutter 211* [CAS]). Recent efforts by the author and others to relocate these historic occurrences have failed.

4. **Monardella follettii** (Jeps.) Jokerst, *comb. et stat. nov.* BASIONYM: *Monardella odoratissima* Benth. var. *follettii* Jeps., *Fl. Calif.* 3:437. 1943. TYPE: UNITED STATES. California: Plumas Co., Rich Gulch, NE slope of red Hill, 2 Aug 1937, *W.I. Follett 108* (HOLOTYPE: JEPS!; Isotype: JEPS!).

The distinctive, narrowly distributed *Monardella follettii* is reported from rocky serpentine slopes in the Sierra Nevada of Plumas Co., California. It is known from the canyon of the North Fork of the Feather River and Meadow Valley. The recently described *M. stebbinsii* Hardham & Bartel is partially sympatric with *M. follettii* in the canyon of the North Fork of the Feather River (Hardham & Bartel 1990).

Monardella follettii shares morphological attributes with a species complex of mostly glabrous, pink flowered serpentine endemics with narrow, leathery bracts. It most closely resembles *M. purpurea* Howell of the North Coast Ranges, which I treat as conspecific with *M. neglecta* E.L. Greene of Marin Co., and *M. villosa* subsp. *subglabra* Hoover of the South Coast Ranges (Jokerst *in* Hickman, in prep.). *Monardella palmeri* A. Gray, a serpentine endemic of the South Coast Ranges in Monterey and San Luis Obispo counties, also is allied with this complex. *Monardella follettii* is distinguished from these taxa by its

conspicuously glandular punctate bracts and calyces (vs. obscure), occasional hairs on the leaves and stems (vs. glabrous), unpressed heads less than 1.5 cm wide (vs. 1.5 cm), and lanceolate bracts (vs. ovate to lance ovate). The internodes of *M. follettii* are generally longer than the leaves and the heads are either solitary on tops of main branches, or in terminal capitate and whorled verticillasters. The related *M. purpurea* and *M. palmeri* generally have shorter internodes and solitary heads at the ends of main branches.

The remaining nomenclatural changes which follow are proposed to recognize, as subspecies, the morphologically and geographically distinct races of the widespread and polymorphic *Monardella villosa*. The article concludes with a key to subspecies of *M. villosa*.

5. **Monardella villosa** Benth. subsp. **franciscana** (Elmer) Jokerst, *comb. et stat. nov.* BASIONYM: *Monardella franciscana* Elmer, Bot. Gaz. (Crawfordsville) 41:320. 1906. *Monardella villosa* Benth. var. *franciscana* (Elmer) Jeps., *Man. Fl. Pl. Calif.* 881. 1925. TYPE: UNITED STATES. California: San Mateo Co., San Pedro, July 1903, *Elmer 4766* (HOLOTYPE: CAS!; Isotype: CAS!).

6. **Monardella villosa** Benth. subsp. **globosa** (E.L. Greene) Jokerst, *comb. et stat. nov.* BASIONYM: *Monardella globosa* E.L. Greene, Pittonia 5:82. 1902. TYPE: UNITED STATES. California: Alameda Co., Leona, August 1892, *Micheuen & Bioletti s.n.* (HOLOTYPE: ND-G!).

Monardella coriacea Heller, Muhlenbergia 1:35. 1904.

Monardella villosa Benth. var. *interior* Jeps., *Fl. Calif.* 3:436. 1943.

This distinctive subspecies is easily distinguished from *Monardella villosa* subsp. *villosa* based on stem, leaf, bract, and head size, and its generally sparse villosity (see key below). Compared with other *M. villosa* subspecies, the leaves and bracts of subsp. *globosa* are disproportionately large relative to the remainder of the plant. Neither Epling (1925) nor Munz (1968) recognized this taxon.

7. **Monardella villosa** Benth. subsp. **obispoensis** (Hoover *in* Jeps.) Jokerst, *comb. et stat. nov.* BASIONYM: *Monardella villosa* Benth. var. *obispoensis* Hoover *in* Jeps., *Fl. Calif.* 3:435. 1943. TYPE: UNITED STATES. California: San Luis Obispo Co., near Cuesta Pass, 20 Jun 1908, *Condit s.n.* (HOLOTYPE: JEPS!).

Key to the Subspecies of *Monardella villosa*

A. Stem and leaves appressed woolly, densely lanate to nearly glabrous; leaves triangular-ovate, base truncate. .....subsp. *franciscana* (Elmer) Epling

A′ Stem and leaves spreading villous, sparse to dense; leaves ovate to lance ovate, base obtuse. ..... B

B. Hairs branched and unbranched; plants matted; corolla white or lavender. ..... subsp. *obispoensis* (Hoover) Jokerst

B′ Hairs simple; plants matted or upright and openly branched; corolla blue or purple. C

C. Leaf blade 1.0-2.2 cm long; outer bracts 0.8-2 cm long; head 1-3 cm wide; stem < 0.5 m tall. ..... subsp. *villosa* Benth. (includes subsp. *subserrata* [E.L. Greene] Epling)

C′ Leaf blade 2.5-5.0 cm long; outer bracts 2-3 cm long; head 2-4 cm wide; stem > 0.5 m tall. .... subsp. *globosa* (E.L. Greene) Jokerst

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NOMENCLATURAL NOTES FOR THE NORTH AMERICAN FLORA. IX

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ABSTRACT

Authorship of new Cyperaceae names, proposed in Small's 1903 work and of *Carex emmonsii* Dewey *ex* Torr. is discussed. Linnaeus' treatment of *Cyperus haspan* L. as an intentional orthographic error for *C. halpan* is accepted. Based on priority, the following are recognized to be the correct names at specific rank: *Cyperus involucratus* Rottb., *Eleocharis acutangula* (Roxb.) Schultes, and *Scirpus leptolepis* Chapman in place of *C. alternifolius* Rottb., *E. fistulosa* Schultes, and *S. cylindricus* (Torr.) Britt., respectively. Furtado's lectotypification of *Scirpus geniculatus* L. is accepted and consequently, *Eleocharis geniculata* (L.) Roemer & Schultes is reinstated in place of *E. caribaea* (Rottb.) Blake. The correct status of *Phaeocephalum* Ehrh. *ex* House is discussed. In substantive, the spelling *berteroi* is maintained over *berterii*. Chapman's 1860 proposals of *Rhynchospora divergens* Chapman and *R. pusilla* Chapman as *spp. nov.* are regarded as isonyms. The quadrinomial *Carex marina* Dewey ssp. *pseudolagopina* (Sorensen) Bocher var. *pseudolagopina* is recognized as two trinomials: *Carex marina* ssp. *pseudolagopina* (Sorensen) Bocher and *Carex marina* var. *pseudolagopina* (Sorensen) Bocher. The complete bibliography is given to validate Hultén's trinomial: *Eriophorum angustifolium* Honckeny ssp. *subarcticum* (Vassil.) Hultén *ex* Kartesz & Gandhi.

KEY WORDS: Floristics, nomenclature, Cyperaceae, *Carex, Cyperus, Eleocharis, Eriophorum, Phaeocephalum, Rhynchospora, Scirpus*, Boott, Hooker, Small

INTRODUCTION

Continuing with the "NOMENCLATURAL NOTES FOR THE NORTH AMERICAN FLORA" (Kartesz & Gandhi 1989, 1990a, b, c, 1991a, b, c, d), a ninth note in the series is presented here toward advancing our understanding of North American plant names.

CYPERACEAE

Carex emmonsii

Carex emmonsii Dewey, a manuscript name, was proposed in Torrey's work (Ann. Lyceum Nat. Hist. New York 3:411. 1836) as a *nomen novum* for both *C. alpestris* sensu Schwein. & Torr. (*non* Allioni 1785, *nec* Lam. 1789) and *C. davisii* Dewey (Amer. J. Sci. 10:279. 1826, *non* Schwein. & Torr. 1825). Since *C. emmonsii* did not require a description for validation, the authorship of this name is questionable, *i.e.*, whether Dewey alone or Dewey *ex* Torr. is the correct author. This situation is similar to the nomenclatural problem of *Vilfa vaginiflora* Torr. *ex* A. Gray (see Kartesz & Gandhi [Phytologia 69:307-309. 1990] on *Sporobolus vaginiflorus* [Torr. *ex* A. Gray] Wood). We conclude that Dewey *ex* Torrey is the author, since Torrey was responsible for validation of this name.

Regarding typification of *Carex emmonsii*, it must be typified by the type of *C. davisii* Dewey. However, the specimens studied by Dewey were not located. Rettig (Sida 13:451. 1989) "lectotypified" *C. davisii* Dewey by Williamstown's 1828 collection (NY) and typified *C. emmonsii* by the preceding lectotype. Since Dewey did not study Williamstown's collection (collected two years after Dewey's publication), Rettig (Sida 14:133. 1990) corrected his earlier lectotypification as a neotypification.

Carex albicans Willd. var. *emmonsii* (Dewey *ex* Torr.) Rettig, Sida 14:133. 1990. *Carex emmonsii* Dewey *ex* Torrey, Ann. Lyceum Nat. Hist. New York 3:411. 1836. *Carex davisii* Dewey, Amer. J. Sci. 10:279. 1826, *non* Schwein. & Torr. 1825. *Carex novae-angliae* Schwein. var. *emmonsii* (Dewey *ex* Torr.) Carey *in* A. Gray, *Manual* 556. 1848. NEOTYPE (*vide* Rettig *l.c.*): U.S.A. Massachusetts: 1828, *Williamstown* (NY).

Carex marina ssp. *pseudolagopina*

Following Kartesz & Gandhi (1991e), the quadrinomial *Carex marina* Dewey ssp. *pseudolagopina* (Sorensen) Bocher var. *pseudolagopina* is recognized with two trinomials as given below.

Carex marina Dewey ssp. *pseudolagopina* (Sorensen) Bocher and var. *pseudolagopina* (Sorenson) Bocher, Feddes Rep. 80:106. 1969. BASIONYM: *Carex pseudolagopina* Sorensen, Meddel. Om Gronl. 101(4):167. 1937.

Cyperus haspan

Kern (1974, pp. 624-625) considered *Cyperus haspan* L. as an orthographic error for *C. halpan* L. On p. 625, Kern stated that "Linnaeus misspelled the vernacular name. According to Art. 73 of the *Code* (example of *Gluta renghas*) this orthographic error must be corrected." In our correspondence with Thieret (KNK), he speculated that Linnaeus might have deliberately spelled the epithet as *haspan*. Hence, we decided to investigate this problem.

In Sinhalese (native language of Sri Lanka), the name halpan refers to a sedge in rice fields (hal = rice; pan = sedge). Trimen (J. Linn. Soc. Bot. 24:135. 1887) believed that the name halpan referred to *Fimbristylis globulosa* (Retz.) Kunth (= *F. umbellaris* [Lam.] Vahl) alone. Later, Trimen (*Handb. Fl. Ceylon* 5:26, 57. 1900) applied this vernacular name to both *C. haspan* and *F. umbellaris*. Seemingly following Trimen's 1900 treatment, several authors, such as Willis (*Revis. Cat. Pl. Ceylon* 101-102. 1911), Fonseka & Vinasithamby (*Provision. Index Local Names Fl. Pl. Ceylon* 28. 1971), and Koyama (*Fl. Ceylon* 5:203-204, 303. 1985) applied the name halpan to both *C. haspan* and *F. umbellaris*. However, Gunawardena (*Gen. & Sp. Pl. Zeylaniae* 208. 1968) applied the name halpan to *C. haspan* alone. Wilson (Cyperaceae Newslett. 9:8. 1991), who rejected Kern's analysis and accepted the name *C. haspan*, followed Trimen's 1887 treatment by assigning the name halpan to *F. umbellaris* alone. Of these authors, Gunawardena, Fonseka, and Vinasithamby are natives of Sri Lanka.

It appears that Hermann (*Mus. Zeylanicum* 23. 1717) was the first to associate the vernacular name halpan with *Cyperus* ("HALPAN. Gramen Cyperinum junceum longissimum."). Burman (*Thes. Zeylanica* 108. 1737) copied Hermann's treatment, but misspelled halpan as haspan (Wilson erroneously attributed *Thes. Zeylanica* to Hermann.). Linnaeus (*Fl. Zeylanica* 37. 1747) cited references to both "...Haspan ...Burm." and "Halpan. Herm." Later, Linnaeus (1753, p. 45) used the name *C. haspan* and referenced his *Fl. Zeylanica*. Therefore, it is evident that Linnaeus was aware of both spellings and deliberately chose the spelling haspan. Linnaeus' usage of haspan must be construed as an intentional orthographic error, which he had done with few other epithets (e.g., *Fagus sylvatica* L. [medieval Latin] instead of *F. silvatica* [classical Latin]). We concur with Thieret and with Wilson that Art. 73 is inapplicable in this case and that haspan is the correct epithet.

Cyperus haspan L., *Sp. Pl.* 45. 1753.

Cyperus involucratus

Throughout much of North America, the umbrella sedge has generally been known by the name *Cyperus alternifolius* L. In Malaysia, Kern (1974, p. 618) used the name *C. flabelliformis* Rottb. for this taxon. He described its stem apices as being scabrulous, its glumes as being ovate, and its fruits as being broadly ellipsoid or slightly obovoid, apiculate, yellowish brown and 3/5-3/4 x 1/2 mm. Kern remarked that the "very closely related *C. alternifolius* L. differs by its smooth stem, ... lanceolate glumes, and narrowly oblong blackish nuts measuring c. 1 by 1/3 mm. It is native to Madagascar, Mauritius, and the Mascarenes; not found growing wild in Malaysia." Kuekenthal (1936, p. 193) recognized *C. flabelliformis* at subspecific rank (*C. alternifolius* ssp. *flabelliformis* [Rottb.] Kuekenthal), whereas Baijnath (1975) recognized it to be specifically distinct under the earlier name: *C. involucratus* Rottb.

In his analysis of this complex, Baijnath provided additional morphological and anatomical characters to substantiate the separation of *Cyperus involucratus* from *C. alternifolius*. Without referencing Baijnath, Koyama (1979, p. 257) assigned the Caribbean umbrella sedge to *C. alternifolius* subsp. *flabelliformis*. Although DeFilipps (in Tutin *et al.* 1980, p. 286) was aware of Baijnath's work, he assigned the European umbrella sedge to *C. alternifolius*. *Cyperus alternifolius* and *C. involucratus* are similar in gross morphology, but some of their macro- and micromorphological differences clearly warrant their independent specific recognition. For the North American flora, we follow Tucker (1983, p. 12) and recognize the name *C. involucratus* for the umbrella sedge.

Cyperus involucratus Rottb., *Descr. Pl. Rar.* 22. 1772.

> *Cyperus flabelliformis* Rottb., *Descr. et Icon. Rar.* 42. 1773. *Cyperus alternifolius* L. subsp. *flabelliformis* (Rottb.) Kuekenthal *in* Engl., Pflanzenr. IV. 20 (Heft 101):193. 1936.
>
> *Cyperus alternifolius* auct. non L.

Eleocharis acutangula

Svenson (1957, p. 511) recognized the name *Eleocharis fistulosa* (Poir.) Schultes (published in 1824; based on *Scirpus fistulosus* Poir., published in 1804) for a pantropical *Eleocharis* species found in Texas. Correll & Johnston (1970, p. 271), and Correll & Correll (1972, p. 375), Kartesz & Kartesz (1980), Soil Conservation Service (1982, p. 63), Hatch *et al.* (1990, p. 35), and Johnston (1990, p. 13) followed Svenson. Unfortunately, the basionym *S. fistulosus* Poir. is a later homonym of *S. fistulosus* Forsk. (published in 1775). Because

of its illegitimacy, the name *S. fistulosus* Poir. must not be considered for purpose of priority (*ICBN* Art. 45 Note 2), and Poiret must not be cited as the parenthetical author (*ICBN* Art. 49). The name *E. fistulosa* must be considered to be a *nom. nov.*, with its priority from 1824 (*ICBN* Art. 72 Note 1).

Kern (1974, p. 525) and Hooper (1976, p. 671) recognized the name *Eleocharis acutangula* (Roxb.) Schultes (based on *Scirpus acutangulus* Roxb., published in 1820). We concur and accept the name *E. acutangula.*

Eleocharis acutangula (Roxb.) Schultes, *Mant.* 2:91. 1824. BASIONYM: *Scirpus acutangulus* Roxb., *Fl. Ind.* 1:213. 1820.

Scirpus fistulosus Poir., *Encyc.* 6:749. 1804, *non* Forsk., 1775. *Eleocharis fistulosa* Schultes, *Mant.* 2:91. 1824.

Eleocharis geniculata

In the protologue of *Scirpus geniculatus* L., Linnaeus (1753, p. 48) included a mixture of two species (later known as *Eleocharis geniculata* [L.] Roemer & Schultes [characterized by eseptate, 0.2-0.4 mm wide stems, and 3-7 mm long and 3-4 mm wide spikelets] and *E. elegans* [Kunth] Roemer & Schultes [characterized by transversely septate, 4-10 wide stems, and 1-2 cm long and 4-7 mm wide spikelets]). Linnaeus' description ("culmo tereti nudo, spica subglobosa terminali") along with his first reference (to "Scirpus culmo nudo, spica terminali subrotunda. *Hort. Cliff.* 21.") as well as his second reference *p.p.* (to "Juncus aquaticus geniculatus, capitulis equiseti, minor. *Sloan. Jam.* 37.") pertained to the former species, whereas the remainder of his second reference (to "Juncus aquaticus geniculatus, capitulis equiseti, major. *Sloan. Jam.* 37.") pertained to the latter species (*fide* Wilson 1990). In his second edition, Linnaeus (1762, p. 71) altered his description slightly ("culmo terreti nudo, spica oblonga terminali"). It is clear that the oblong shape of the spikelet applied more to *E. elegans* than to *E. geniculata.* Hence, confusion has existed in the past regarding the application of the Linnaean binomial.

In the early 1930s, Dandy investigated this problem and conveyed his results to both Furtado and Svenson (*fide* Svenson 1939, p. 50). Based on Dandy's results, Furtado (1937, pp. 293, 298) lectotypified the name *Scirpus geniculatus* by a specimen referable to *Eleocharis geniculata.* Prior to Furtado's typification, Svenson (1937, p. 259) treated *E. elegans* as a synonym of *E. geniculata.* However, subsequent to the typification, Svenson (1939, p. 51) recognized *E. geniculata* and *E. elegans* to be two distinct species. Wilson (1990, p. 7) stated that both Furtado and Svenson independently lectotypified the name *S. geniculatus.* However, except for quoting excerpts from Dandy's

letter on the lectotypification and for referencing Furtado's publication, Svenson had no comment on the typification. Hence, Furtado alone was responsible for the lectotypification of the name *S. geniculatus*.

Eighteen years later, Svenson (1957, p. 533, as a note) reversed his 1939 position by rejecting *Scirpus geniculatus* as a *nom. conf.* and accepting (pp. 520-521) the name *Eleocharis caribaea* (Rottb.) Blake (in place of *E. geniculata*). His treatment suggested that he rejected Furtado's lectotypification. Correll & Johnston (1970, p. 274), Correll & Correll (1972, p. 384), Voss (1972, p. 342), Soil Conservation Service (1982, p. 63), and Hatch *et al.* (1990, p. 35) perhaps following Svenson's 1957 work, recognized the name *E. caribaea*, whereas several well known sedge specialists such as Kern (1974, p. 536), Hooper (1976, p. 672), Koyama (1979, p. 232), Walters (in Tutin *et al.* 1980, p. 282), and Wilson (1990) followed Furtado's lectotypification and accepted the name *E. geniculata* in place of *E. caribaea*. We concur with the preceding authors and continue to recognize *E. geniculata*.

Eleocharis geniculata (L.) Roemer & Schultes, *Syst. Veg.* 2:150. 1817. BASIONYM: *Scirpus geniculatus* L., *Sp. Pl.* 48. 1753. LECTOTYPE (*vide* Furtado, *l.c.*): BM.

Scirpus caribaeus Rottb., *Descr. Pl. Rar.* 24. 1772. *Eleocharis caribaea* (Rottb.) Blake, Rhodora 20:24. 1918.

Eriophorum angustifolium ssp. *subarcticum*

For the North American flora, we follow Hultén's reduction of *Eriophorum subarcticum* Vassil. to *E. angustifolium* Honckeny ssp. *subarcticum* (Vassil.) Hultén (Kongl. Svenska Vetenskapsakad., band 8, no. 5:58, 243. 1962). Unfortunately, this combination remains invalid to date for the following reasons. First, on pp. 58 and 243, Hultén did not provide complete bibliographic details regarding the basionym. Second, the bibliography section of Hultén's work has no reference on Vassiljev. Therefore, Hultén did not meet the requirements of *ICBN* Art. 33.2 for a new combination. The complete bibliographic details of the basionym are given below to validate Hultén's subspecific name.

Eriophorum angustifolium Honckeny ssp. **subarcticum** (Vassil.) Hultén *ex* Kartesz & Gandhi, *comb. et stat. nov.* BASIONYM: *Eriophorum subarcticum* Vassil., Bot. Mater. Gerb. Bot. Inst. Komarov Akad. Nauk SSSR 13:58. 1950. TYPE: East Asia, Ochotensis, near Najachan, Sep 1938, *Medvedev & Nepli s.n.* (?LE).

Phaeocephalum: Nomenclaturally Superfluous, Taxonomic Synonym

Rhynchospora Vahl (*Enum. Pl.* 2:229. 1806) is a conserved generic name, with its type *R. alba* (L.) Vahl (based on *Schoenus albus* L.) also conserved. Ehrhart (Beitr. 4:146. 1789) proposed *Phaeocephalum* as an unitary name for *S. fuscus* L. (= *R. fusca* [L.] Ait. *f.*). In the Paris Congress (Lanjouw *et al.* 1956, Art. 68) and prior to that, *Phaeocephalum* Ehrh. was treated as an illegitimate name; however, in the Montreal Congress (Lanjouw *et al.* 1961, Art. 20 Note 2) and presently (Art. 20 Ex. 10), it is merely regarded as an unitary name, *i.e.*, not a generic name.

House (Amer. Midl. Naturalist 6:201. 1920) revived *Phaeocephalum*, ascribed it to Ehrhart, cited *Schoenus fuscus* as the type, and made 43 new combinations within it. House's treatment was based on the belief that *Phaeocephalum* was validly published by Ehrhart and that it had priority over *Rhynchospora*. House did not provide a description for *Phaeocephalum*; however, his citation of *Rhynchospora* as a synonym (an indirect reference to its generic description) inadvertently validated *Phaeocephalum* as a generic name. At the time of House's publication, *Rhynchospora* was neither conserved nor typified.

Farr *et al.* (1979: 1305) mentioned that *Phaeocephalum* Ehrh. *ex* House is a nomenclatural synonym of *Rhynchospora*, which suggested homotypy. However, such a view is refuted here. *Phaeocephalum* was typified by a type different from that of *Rhynchospora* (heterotypy); therefore, the former must be classified as a taxonomic synonym of the latter.

The removal of *Rhynchospora fusca* from *Rhynchospora* may remove the taxonomic superfluity from *Phaeocephalum*, but such a removal would not remove the illegitimacy from *Phaeocephalum*, since the latter was validated by House's reference to the circumscription of *Rhynchospora* (i.e., *Phaeocephalum* included the circumscription of *Rhynchospora*). Hence, the name *Phaeocephalum* must be classified as nomenclaturally superfluous when published, and thus illegitimate.

Rhynchospora berteroi

Based on Bertero's collection from Guadeloupe, Sprengel (*Neue Entd.* 1:241. 1820) proposed "*Hypoelytrum berterii.*" Since Sprengel used the epithet in substantive, "*H. berterii*" is to be treated as an orthographic error and must be corrected to "*H. berteroi*" (*ICBN* Rec. 73C.1a). In *Rhynchospora* Vahl, it must be cited as *R. berteroi* (Spreng.) C.B. Clark. (cf. Thomas [1984, p. 34] used both "*H. berterii*" and *R. berteroi*).

Rhynchospora divergens and *R. pusilla*

Based on Chapman's manuscript name, Curtis (Amer. J. Sci. II. 7(21):409. 1849) described *Rhynchospora divergens* and attributed it to Chapman. Curtis remarked that *R. divergens* "has the closest affinity with *R. pusilla*, Chapm. mss., from which it differs in several particulars, especially in the achenium which is not rugulose." Curtis' remarks suggested that the achenium of *R. pusilla* is rugulose. He further stated that *R. pusilla* lacked hypogynium bristles. These were the only two descriptive characters provided by Curtis for *R. pusilla*. Perhaps unaware of Curtis' treatment, Chapman (1860, p. 528) proposed these two taxa as *spp. nov.*

Prior to the 1987 Congress (in Berlin), Curtis' treatment of *Rhynchospora pusilla* could have been rejected as an incidental mention (Voss *et al.* 1983, *ICBN* Art. 34.1c) and thus, its publication in Chapman's 1860 work would be valid. However, Art. 34.1c, pertaining to incidental mention, was dropped at the Berlin Congress (Greuter *et al.* 1988) rendering *R. pusilla* to be validly published in Curtis' work. Thomas (1984, p. 35) erred in attributing *R. pusilla* to Chapman alone. Since the types for both Chapman's and Curtis' treatments are the same, Chapman's *spp. nov.* must be considered as isonyms (Nicolson, Taxon 24:461-466. 1975).

Rhynchospora divergens Chapman *ex* Curtis, Amer. J. Sci. II. 7:409. 1849.

Rhynchospora pusilla Chapman *ex* Curtis, Amer. J. Sci. II. 7:409. 1849.

Rhynchospora globularis

Koyama (1979, pp. 297-298) attributed *Rhynchospora globularis* to "(Chapman) Small [*Man. Southeast. Fl.* 184. 1933; *comb. invalida*] *ex* Gale" (Rhodora 46:243. 1944) and cited its basionym: *R. cymosa* Ell. var. *globularis* Chapman (Koyama erroneously attributed *R. cymosa* to Nuttall.) Koyama mentioned *R. pinetorum* Britt. & Small *ex* Small (*l.c.*, p. 1933) as a synonym.

Small (*l.c.*) neither proposed *Rhynchospora globularis* as a *comb. nov.* nor cited its basionym. Moreover, in his list of new names proposed in his work, Small (p. 1503) did not list *R. globularis*. Perhaps, for these reasons, Koyama considered Small's combination as invalid. However, we emphasize the fact that if Koyama's treatment is accepted, then *R. pinetorum* (published in 1933) would be the correct name for this complex, since it would have priority over *R. globularis* (published in 1944) at specific rank. Our analysis follows.

For his combination, Small cited Chapman to be the parenthetical author. This citation must be construed as an indirect reference to Chapman's variety. Therefore, we conclude that it was Small's intention to make the combination and that he met the requirements of *ICBN* Art. 32.3 for valid publication of new combinations made prior to 1953.

Rhynchospora globularis (Chapman) Small, *Man. S.E. Fl.* 184. 1933. BASIONYM: *Rhynchospora cymosa* Ell. var. *globularis* Chapman, *Fl. S. U.S.* 525. 1860.

Scirpus leptolepis

Koyama (1962, p. 930) proposed *Scirpus subterminalis* Torr. var. *cylindricus* and cited the following as synonyms: *S. canbyi* A. Gray, *S. cylindricus* (Torr.) Britt., *S. etuberculatus* (Steud.) O. Kuntze, *S. leptolepis* Chapman, *S. macranthus* Boeckl., *S. maritimus* L. var. *cylindricus* Torr., and *S. torreyi* Olney.

We recognize *Scirpus etuberculatus* (incl. *S. macranthus*) and *S. torreyi* as distinct from the above taxa. For the remainder of the complex, we conclude that *S. leptolepis* is the correct name at specific rank.

Scirpus leptolepis Chapman, *Fl. S. U.S.* 520. 1860.

Scirpus maritimus L. var. *cylindricus* Torr., Ann. Lyceum Nat. Hist. New York 3:325. 1836. *Scirpus cylindricus* (Torr.) Britt., Trans. New York Acad. Sci. 11:79. 1892. *Scirpus canbyi* A. Gray, Proc. Acad. Nat. Sci. Philadelphia 18. 1864.

Authorship of New Cyperaceae Names Proposed in Small's 1903 Work

Small (1903, pp. 1327-1328) listed 25 new Cyperaceae names (treated on pp. 161-221, 1321), either as *sp. nov.* or *comb. nov.* He erred in listing *Rhynchospora intermedia* (Chapman) Britt. as a *comb. nov.*, since it had been published previously in Britton's work (Trans. New York Acad. Sci. 11:87. 1892). Furthermore, Small failed to list two names: *Cyperus careyi* Britt. *sp. nov.* and *Dichromena floridensis* Britt. *sp. nov.*; hence, the correct number is 26, of which 21 were ascribed to Britton, four to Small, and one to Harper. Regarding the authorship of the 21 names ascribed to Britton, recent authors differ, with some attributing them to Britton alone (Gleason, *New Britt. & Brown Ill. Fl.* 1:285, 290. 1952) and others to Britton *ex* Small (Gale 1944, pp. 105, 172, 233, 262; Thomas 1984, pp. 60, 77, 79). Our analysis follows.

On p. 161 (in a footnote), Small stated that the Cyperaceae treatment was prepared "with the assistance of Dr. Nathaniel Lord Britton," *i.e.*, Small prepared Cyperaceae with the assistance of Britton. Therefore, both Small and Britton are the authors of this treatment, with Small being the first author.

Regarding the authorship of *Dichromena floridensis*, Thomas (p. 79) argued that the description "is in Small's style and Britton indicated a previous

lack of familiarity with the species by describing it as new (*D. inaguensis*) in 1920." We disagree with Thomas' analysis. First, since Small was the major author, editor, and publisher of his work, it is logical to assume that he edited contributions from others, such as Pteridophyta by Underwood and Poaceae by Nash. Second, even though *D. inaguensis* is presently treated conspecifically with *D. floridensis*, Britton was not the first (and would not be the last) to describe a new species and to disregard its closeness to his previously published species. Untold volumes could be amassed documenting the plethora of miscalculations by workers who erred in their taxonomic judgments in treating trivial geographical morphs as new biological taxa, or by those who described new taxa under misapplied names. Hence, Britton's proposal of *D. inaguensis* as a new endemic species, with its type from the Bahamas, must be treated within that realm of taxonomic miscalculation. However, in no way should this reflect on his lack of familiarity with *D. floridensis*, which was based on a type from Florida. In checking for Thomas' comments on Small's footnote (which acknowledges Britton's assistance on the treatment of Cyperaceae), we found none. Thus, we assert that Britton alone is the author of those 21 names, Small of four names, and Harper *ex* Small & Britt. of one name, as listed below.

1) *Carex radiata* (Dewey) Small
2) *Carex reniformis* (Bailey) Small
3) *Cyperus careyi* Britt.
4) *Cyperus floridanus* Britt.
5) *Cyperus nashii* Britt.
6) *Cyperus pollardii* Britt.
7) *Cyperus plankii* Britt.
8) *Cyperus subuniflorus* Britt.
9) *Dichromena floridensis* Britt.
10) *Eleocharis macrostachya* Britt.
11) *Eleocharis praticola* Britt.
12) *Eleocharis ravenelii* Britt.
13) *Fimbristylis drummondii* (Torr. & Gray) Britt.
14) *Fimbristylis perpusilla* Harper *ex* Small & Britt.
15) *Rhynchospora curtissii* Britt.
16) *Rhynchospora earlei* Britt.
17) *Rhynchospora indianolensis* Small
18) *Rhynchospora microcephala* (Britt.) Britt.
19) *Rhynchospora mixta* Britt.
20) *Rhynchospora perplexa* Britt.
21) *Rhynchospora planckii* Britt.
22) *Rhynchospora prolifera* Small
23) *Rhynchospora smallii* Britt.
24) *Scleria curtisii* Britt.
25) *Scleria glabra* (Chapman) Britt.
26) *Stenophyllus coarctatus* (Ell.) Britt.

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A NEW SPECIES OF *VERBESINA* (ASTERACEAE, HELIANTHEAE) FROM JALISCO, MEXICO

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ABSTRACT

A new species, **Verbesina bolanosana** B. Turner, is described from near Bolaños, Jalisco. It is closely related to *V. longifolia* A. Gray and *V. corral-diazii* B. Turner but differs from both in having markedly ovate leaves with cordate bases. A map showing the distribution of these several species is included.

KEY WORDS: Asteraceae, Heliantheae, *Verbesina*, México

Routine identification of Mexican Asteraceae has revealed the following novelty.

Verbesina bolanosana B. Turner, *sp. nov.* TYPE: MEXICO. Jalisco: carretera Huejuquilla-Bolaños, bosque de encino, 2150 m, without date, *Darío Narvaes y Rene L. 23094* (HOLOTYPE: TEX!; Isotype: GUADA).

Verbesinae corral-diazii B. Turner similis sed differt foliis 2.5-4.0 plo longioribus quam latioribus ovatis viridisque (vs. 4-8 plo longioribus quam latioribus bicoloribus lanceolatisque) et capitulis majoribus.

Suffruticose stiffly erect perennial herbs to 80 cm high. Stems brownish, moderately puberulent. Leaves alternate, mostly 8-13 cm long, 2.5-4.0 cm wide; petioles 1-3 mm long; blades ovate, pinnately nervate, subcordate at the base, the margins remotely serrulate to nearly entire, the lower surfaces moderately, but uniformly, puberulent, more so along the veins. Heads large, terminal, hemispheric, 6-7 cm across the expanded rays, the peduncles (from uppermost reduced leaves) 1-3 cm long. Involucre 10-15 mm high, 3-4 seriate,

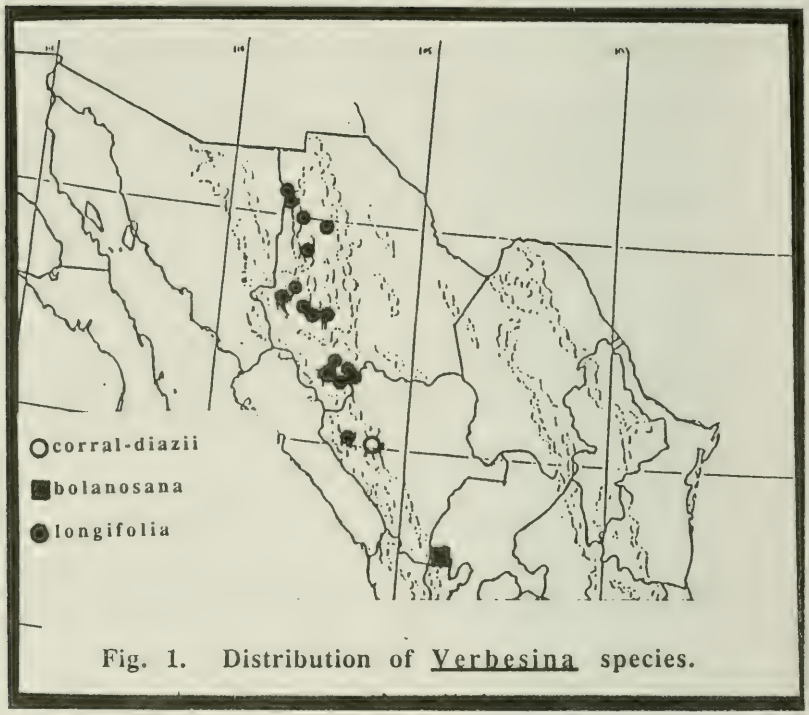

Fig. 1. Distribution of Verbesina species.

the outer bracts foliaceous, loose and spreading, longer than the inner bracts. Pales lanceolate, acute, pubescent, somewhat shorter than the florets. Ray florets 11-21, neuter, the ligules yellow, ca. 25 mm long, ca. 8 mm wide. Disk florets numerous, the corollas yellow, ca. 7 mm long, markedly pubescent, especially below, the tube ca. 1 mm long, the lobes ca. 1 mm long; achenes (immature) ca. 5 mm long, glabrous, epappose.

Verbesina bolanosana is closely related to *V. longifolia* A. Gray and *V. corral-diazii* B. Turner, having the general leaf shape of the latter but the vestiture of the former. It differs from both in having ovate leaves (vs. lanceolate) with cordate bases. A map showing the distribution of these several taxa is shown in Fig. 1, which is modified from that of Turner (1984; Phytologia 55:501). Recent collections at the type locality of *V. corral-diazii* by Jose Panero (pers. comm.) show that the species is a very localized endemic, the population concerned differing markedly from those of both *V. longifolia* and *V. bolanosana.*

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A NEW SPECIES OF *LOBELIA* (CAMPANULACEAE) FROM OAXACA, MEXICO

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ABSTRACT

Lobelia macdonaldii B. Turner, a new species from Cerro Quiexobra, Oaxaca, México is described and illustrated. It apparently belongs to the section *Holopogon*, subsect. *Cryptostemon*, where it appears to have no close relatives.

KEY WORDS: *Lobelia*, Campanulaceae, México

Identification of plants collected on the remote and botanically poorly explored Cerro Quiexobra, Oaxaca, by Dr. Andrew McDonald has revealed the following novelty.

Lobelia macdonaldii B. Turner, *sp. nov.* Fig. 1. TYPE: MEXICO. Oaxaca: Mpio. Miahuatlán, 35 km ESE of Miahuatlán, 5 km NE of Santo Domingo Ozolotepec, Cerro Quiexobra; "subalpine glades surrounded by pine forest and in mountain saddles.", 3500-3700 m, 3 Oct 1990, *Andrew McDonald 2996* (HOLOTYPE: TEX; Isotype: MEXU).

Lobeliae jaliscensi McVaugh similis sed plantis grossioribus, foliis plerumque basalibus late oblanceolatis vel elliptici-lanceolatis, et caulibus dense hirsutis differt.

Perennial hispidulous herbs 4-10 cm high. Leaves mostly basal, the 1-3 cauline leaves lanceolate elliptic to oblanceolate, 2-3 cm long, 5-10 mm wide, sessile, irregularly serrate to nearly entire, the basal leaves similar but somewhat longer (3-5 cm). Stems short-hispidulous throughout, arising from short, thick, rhizomes. Inflorescences seemingly scapose, or arising from short erect stems 1-3 cm long, the flowers arranged 3-10 in mostly secund racemes, the

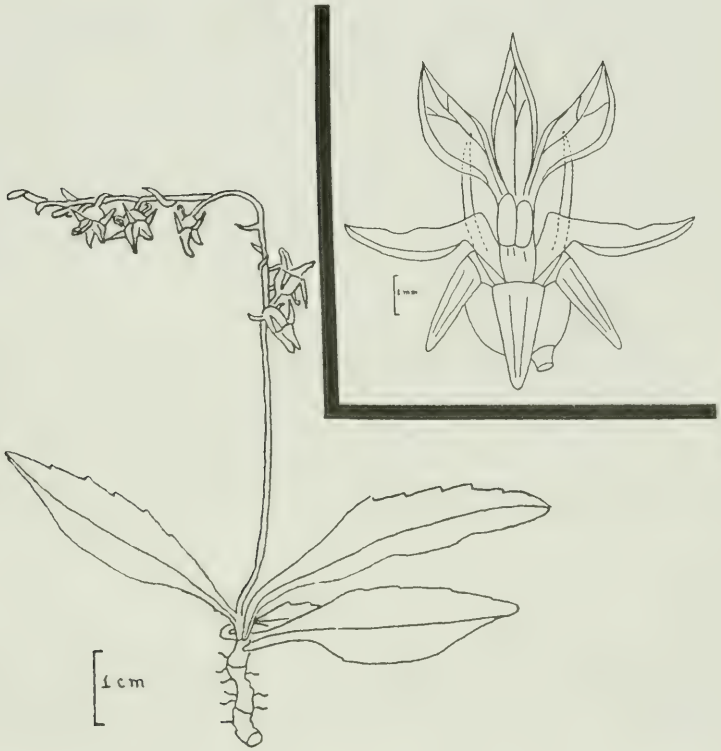

Fig. 1. From holotype: L. macdonaldii (habit); flower (inset).

pedicels mostly 2-5 mm long. Calyx hispidulous, ca. 7 mm high (including hypanthium), the lobes lanceolate, ca. 4 mm long, ca. 1 mm wide at midlength, the margins with 1-3 small teeth, rarely not. Corollas (including hypanthium) bilabiate, 10-11 mm long, the corolla tube blue, ca. 4 mm long, slit dorsally to the base, markedly fenestrate, the 2 dorsal petals barely coherent at the apex of the tube, the lobes ca. 4 mm long, the 3 ventral petals with lobes 5-7 mm long. Stamens (at anthesis) ca. 4 mm long, the filaments pubescent, ca. 2.5 mm long, the anthers markedly unequal, the smaller set ca. 1 mm long, the larger set ca. 2 mm long, all of these ca. equally pubescent with white, loosely strigilose hairs, more densely so at their apices. Seeds (slightly immature) ca. 0.8 mm long, glabrous, smooth.

The species appears to belong to the subgenus *Lagotis*, section *Holopogon*, subsection *Cryptostemon* (sensu Wimmer 1943: *in* A. Engler's *Das Pflanzenreich*. IV. 2766. Tier 1. Heft 106) where it appears to have no close relatives, although I have compared the species to *Lobelia jaliscensis* McVaugh.

It is a pleasure to name this species for the only known collector, Dr. Andrew McDonald, who has been the first worker to assemble any large series of plants from the subalpine region of Cerro Quiexobra, many of these having been described as new to Science.

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I am grateful to Guy Nesom for the Latin diagnosis, and to him and Andrew McDonald for reviewing the manuscript. My son, Robert Turner, provided the illustration.

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STUDIES ON THE GENUS *BIDENS* L. (COMPOSITAE) FROM THE EASTERN HEMISPHERE. 1. A NEW NAME AND A NEW COMBINATION FROM WEST TROPICAL AFRICA

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ABSTRACT

A new name and a new combination are provided for two species of African Compositae: **Bidens mannii** *nom. nov.* (= *Verbesina monticola* Hook. *f.*) and **Bidens barteri** *comb. nov.* (= *Coreopsis barteri* Oliver & Hiern). Lectotypes are selected for both names.

KEY WORDS: *Bidens, Coreopsis, Verbesina*, Compositae, taxonomy, Africa

This is the first in a series of papers dealing with the taxonomy of the genus *Bidens* L. from the Eastern hemisphere. Subsequent papers will include notes on typifications of African names, an account of the genus for the Flora of Tropical East Africa, and will culminate in a revision of *Bidens* for the whole of the Old World.

INTRODUCTION

The inclusion of African *Coreopsis* L. within *Bidens* was first proposed by Wild (1967). He considered the main distinction used by Sherff (1937) to segregate these two genera in Africa (the presence in *Coreopsis* and absence in *Bidens* of lateral wings on the cypselas) as unsatisfactory since it would lead to the separation of "obviously closely related species." This position has been followed by Mesfin Tadesse (1984) and Lisowski (1990). My own work (ined.) has also shown that African *Bidens* and *Coreopsis* are congeneric. The above authors have already moved many African *Coreopsis* to *Bidens*, however the following two transfers are still required.

Bidens mannii T.G.J. Rayner, *nom. nov.* Replaced synonym: *Verbesina monticola* Hook. *f.*, J. Proc. Linn. Soc., Bot. 7:200. 1864. TYPE: CAMEROON. Cameroons mountains, 6 Nov. 1862, *Gustav Mann 1922* (LECTOTYPE [here selected]: K; Isolectotypes: GH [2 sheets], W). *Coreopsis monticola* (Hook. *f.*) Oliver & Hiern *in* Oliver, *Fl. Trop. Afr.* 3:390. 1877.

Hooker's protologue for *Verbesina monticola* (1864) was drawn from the *Gustav Mann* nos. *1219* and *1922* at K, both formerly in Hooker's own herbarium. Duplicates of the latter collection are housed at GH and W, but these bear no indications that they were seen by Hooker, and so are not considered for selection as lectotypes. Sherff (1936) stated that the "type" of this name was the specimen of *Mann 1922* at K, with "cotypes" at B and GH. At no point does he mention the syntype *Mann 1219*. This implies to me that he thought that *Mann 1922* at K was the holotype of this taxon, and thus I consider that he did not choose a lectotype.

The sheets of *Mann 1922* and *1219* at K are of similar quality, both bearing numerous leaves and capitula at various stages of development, including some with mature cypselas, and were probably used equally by Hooker in drawing his diagnosis and description. I have therefore decided to choose *Mann 1922* as the lectotype because of the existence of duplicates of this collection at GH and W.

The name *Bidens mannii*, chosen in honour of the collector of the type specimen, is necessitated by the prior existence of the validly published name *Bidens monticola* Poeppig (1843).

Bidens barteri (Oliver & Hiern) T.G.J. Rayner, *comb. nov.* BASIONYM: *Coreopsis barteri* Oliver & Hiern *in* Oliver, *Fl. Trop. Afr.* 3:390. 1877. TYPE: WEST TROPICAL AFRICA. on the Niger, *W.B. Baikie s.n.* (LECTOTYPE [here selected]: K).

Oliver & Hiern (1877) cited two collections in their protologue: *Charles Barter 870* and *W.B. Baikie s.n.* Both syntypes are at Kew. Sherff (1936), following his usual practice of choosing the first cited specimen as the type, selected *Barter 870*. As a mechanical method of selection this is contrary to Article 8.1 of the *International Code of Botanical Nomenclature* (Greuter *et al.* 1988) and this choice may therefore be superseded. In choosing a new lectotype I have taken into account the following factors. Both specimens closely fit Oliver & Hiern's original description and clearly belong to the one taxon. The Baikie specimen, however, possesses flowering and fruiting capitula with mature cypselas, in contrast to *Barter 870* which only possesses a few insect damaged flowering heads. As mature fruit are of critical importance in differentiating between *Bidens barteri* and its nearest relatives I have chosen the Baikie specimen as the lectotype.

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CHROMOSOME NUMBERS FOR FIVE CHIHUAHUAN SPECIES OF *QUERCUS* (FAGACEAE)

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ABSTRACT

Chromosome numbers determined from mitoses in root tips of sprouted acorns are reported for *Quercus basaseachicensis* Muller, *Q. chihuahuensis* Trel., *Q. depressipes* Trel., *Q. knoblochii* Muller, and *Q. rugosa* Neé. All are $2n = 24$, consistent with most others reported for this genus.

KEY WORDS: *Quercus*, Fagaceae, México, chromosome numbers

As part of the requirements for a class in cytogenetics offered by Dr. Max Dunford, chromosome numbers were determined for five oak species by S.R.T. Because oak chromosome numbers are so uniform, we do not plan to make further determinations in the foreseeable future. Therefore, we make available these counts. All are first reports for the species, and prior to now, no reports have been published for species of Mexican groups of *Quercus*. The following reports include one black oak (*Q. knoblochii*) and four white oaks, one narrow endemic (*Q. basaseachicensis*), two shrubs, the latter of which is extensively rhizomatous (*Q. basaseachicensis* and *Q. depressipes*), and three trees. Therefore, consistent with other reports of chromosome number, there is no indication that chromosome number varies according to habit.

Freshly collected acorns were germinated at room temperature in moist peatmoss. Root tips were pretreated in 0.3% colchicine for 2 hrs, fixed in 100% ethanol and glacial acetic acid (3:1, v:v) for 24 hrs, and were stored in 70% ethanol under refrigeration. Root tips were squashed and stained in acetocarmine, and observed at 1000× with phase contrast. Place of deposition of voucher specimens are cited below; each at NMC has associated with it a drawing of the chromosomes prepared with the aid of a camera lucida. The chromosome number of $2n = 24$ is consistent with all but a few of the several dozen that have been reported and listed in indices of plant chromosome numbers.

Quercus basaseachicensis Muller. $2n = 24$. MEXICO. Chihuahua: Mcpo. Ocampo, Parque Nacional de la Cascada de Basaseachic, 108°12′30″W, 28°10′N, 1980 m, 26 Sep 1991, *Spellenberg, Boecklen, & Gregory 10924* (CIIDIR,MEXU,NMC). Four plants make up the collection distributed under this number, twigs from different individuals identified by the letters A-D; the count was determined from the plant marked "A," which closely resembles an isotype from TEX.

Quercus chihuahuensis Trel. $2n = 24$. MEXICO. Chihuahua: Mcpo. Guerrero, 16 km E of Cuauhtemoc, 106°45′W, 28°24′N, 1970 m, 28 Sep 1991, *Spellenberg, Boecklen, & Gregory 10930* (NMC).

Quercus depressipes Trel. $2n = 24$. MEXICO. Chihuahua: Mcpo. Guerrero, 13 km E of Tomochic, ca. 1 km S of highway, 107°47′W, 28°23′N, 2120 m, 23 Sep1991, *Spellenberg, Boecklen, & Gregory 10897* (CAS,MEXU,NMC).

Quercus knoblochii Muller. $2n = 24$. MEXICO. Chihuahua: Mcpo. Ocampo, 6.4 km W of Ocampo at km 33 on road to Moris, 108°22′W, 28°11′N, 2070-2200 m, 26 Sep 1991, *Spellenberg, Boecklen, & Gregory 10914* (CAS, CIIDIR,IBUG,MEXU,NMC,NY). This collection is a long series documenting variation in this population, individual plants identified by numbers; the count was made from plant marked "18" among the twigs distributed in this collection. All herbaria cited will receive samples of number 18, in addition to other twigs.

Quercus rugosa Neé. $2n = 24$. MEXICO. Chihuahua: Mcpo. Ocampo, ca. 8 km by winding road E of Ocampo, steep W facing slope, 108°19′W, 25°11′N, 2060 m, 26 Sep 1991, *Spellenberg, Boecklen, & Gregory 10923* (NMC).

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SCHINUS TEREBINTHIFOLIUS (ANACARDIACEAE) IN TEXAS

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ABSTRACT

A description of *Schinus terebinthifolius* and a key to the three species of *Schinus* known to be naturalized in Texas are provided to update the treatment of the genus in Correll & Johnston's (1970) *Manual of the Vascular Plants of Texas.*

KEY WORDS: *Schinus*, Anacardiaceae, Texas, floristics

Schinus L. comprises 27 species of shrubs and small trees native to tropical America (Barkley 1944). Two of the South American species, *S. molle* L. (California pepper-tree, Peruvian mastic-tree) and *S. terebinthifolius* Raddi (Brazilian pepper-tree), have been widely introduced as ornamentals in tropical and subtropical regions, often escaping and becoming naturalized.

Correll & Johnston (1970) reported two species of *Schinus, S. molle* and *S. longifolius* (Lindl.) Speg. & Girola, as naturalized in south Texas. Although *S. terebinthifolius* has been sporadically collected from the same area over the last 45 years, it was not included in their treatment of the genus. The present paper provides a description of *S. terebinthifolius* and a key to the three species naturalized in Texas to update the treatment of Correll & Johnston (1970).

Key to the Species of *Schinus* Naturalized in Texas

1. Leaves simple; stems spinescent. .....1. *S. longifolius*
1. Leaves pinnately compound; stems not spinescent. .....(2)
    2. Leaflets 15-40, lanceolate to linear-lanceolate. .....2. *S. molle*
    2. Leaflets 5-9, narrowly ovate to elliptic. .....3. *S. terebinthifolius*

1. *Schinus longifolius* (Lindl.) Speg. & Girola–A native of Argentina and Brazil, *S. longifolius* is distinctive among the cultivated species of *Schinus* by its simple leaves and spinescent branches. The species was reported by Correll & Johnston (1970) to be naturalized in south Texas.

2. *Schinus molle* L.–This species, reported by Correll & Johnston (1970) to be a volunteer in the Brownsville area (Cameron Co.), has also been collected from Zapata and Webb counties.

3. *Schinus terebinthifolius* Raddi–Shrubs or small trees to 5 m high with a low spreading crown; bark smooth initially, later becoming furrowed and slightly scaly; leaves alternate, odd-pinnate, 10.-17 cm long, 8-15 cm broad; leaflets (5-)7(-9), the lateral ones sessile or subsessile, the terminal one tapered to a winged petiolule, narrowly ovate to elliptic, 3.5-10. cm long, 1.5-3.5 cm broad, rounded to cuneate and slightly asymmetrical at the base, acute at the apex, at the margins distinctly or indistinctly serrate; petioles and rachises reddish above, green below, the rachis winged distally; inflorescences axillary in the upper leaves, paniculate, 3-10 cm long, the branches minutely pubescent; flowers small, perfect or rarely staminate; sepals 5, green, triangular, 0.5 mm long; petals 5, yellowish-white, narrowly ovate to obovate, 2 mm long, 1 mm wide; stamens 10; ovary sessile, surrounded by a yellowish nectar disk; fruits globose, red, 3.5-5.0 mm in diameter.

Schinus terebinthifolius has been sporadically collected over the past 15 years from Cameron and Hidalgo counties, where it occurs both in cultivation and naturalized along the banks of several resacas. In November, 1991, I collected the species in the Copano Cove subdivision west of the city of Rockport (Aransas Co.), approximately 220 km north of the closest South Texas locality. The well established population of more than 100 individuals was growing in association with *Prosopis glandulosa* Torr., *Berberis trifoliolata* Moric., *Condalia hookeri* M.C. Johnston, *Zanthoxylum fagara* (L.) Sarg., *Opuntia engelmannii* Engelm., *Forestiera angustifolia* Torr., and *Malvaviscus arboreus* Cav.

Most of the Texas specimens of *Schinus terebinthifolius* are referable to var. *raddianus* Engl., characterized by glabrate stems and leaflets, the leaflets mostly 3-7 in number, the terminal leaflet noticeably larger than the laterals. One specimen from Cameron Co. is referable to var. *rhoifolius* (Mart.) Engl., characterized by an enlarged terminal leaflet but with the young branchlets, petioles, rachises, and midvein and margins of the leaflets short-pilose.

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Appreciation is extended to Lynn Marshall, for calling to my attention the existence of the Aransas Co. population of *Schinus terebinthifolius*, and to Guy Nesom and Mark Bierner, for their critical reviews of the manuscript.

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CAYRATIA JAPONICA (VITACEAE) AND *PAEDERIA FOETIDA* (RUBIACEAE) ADVENTIVE IN TEXAS

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ABSTRACT

Cayratia japonica (Thunb.) Gagnepain (Vitaceae) and *Paederia foetida* L. (Rubiaceae) have been found as adventive vines in Houston, Texas. A key is provided to distinguish *P. foetida* from *P. cruddasiana* Prain, the two adventive species in the United States.

KEY WORDS: *Cayratia japonica*, *Paederia foetida*, *Paederia cruddasiana*, *Paederia scandens*, vines, Vitaceae, Rubiaceae, Texas

In 1990 Mr. and Mrs. Herman Greiner invited Dr. John Tveten to their Houston home to view an unknown rampant vine. Tveten brought specimens of the vine to the SBSC herbarium. I identified it as *Cayratia japonica* (Thunb.) Gagnepain (Stewart 1958). Shinners (1964) reported this Asiatic vine new to North America from St. Tammany Parish, Louisiana. MacRoberts (1989) reported it from four additional eastern Louisiana parishes. The present collection is apparently the first in Texas.

The Greiners communicated to Tveten that this vine has been on their property for about 37 years and is climbing into the trees and shrubs and would cover them up if not periodically pulled down. Tveten indicated (pers. comm.) that the flowers are small, salmon colored, and seemed to be falling off rather than setting fruit.

Specimens collected: UNITED STATES. Texas: Harris Co., a rampant vine at 6644 Lindy Lane, SE Houston, 17 Sep 1990, *John Tveten s.n.* (SBSC, duplicates to be distributed to ASTC,SMU,TAES, and TEX).

In the fall of 1989, Lynn Lowrey brought a flowering vine to the herbarium for identification. The flowers were rubiaceous and keyed out to the genus *Paederia* (Stewart 1958). After consulting a number of Asian floristic manuals, I tentatively identified the collection as *P. scandens* (Lour.) Merrill. To confirm

my identification, I borrowed some sheets from US, MO, and USF. Christian Puff discovered my loan from MO in *Herbarium News* and informed me of his 1991 revision of the genus in which the names *P. scandens* and *P. foetida* refer to the same species.

The following key, derived from the Puff revision, will serve to distinguish the two adventive species in the United States.

1. Fruits 6-11 mm wide, elliptic to broadly ovate, laterally compressed; pyrenes winged, separating from a filiform carpophore. *P. cruddasiana*

1. Fruits 4-6 mm wide, globose, not compressed; pyrenes not winged, carpophore absent. ..... *P. foetida*

Paederia cruddasiana Prain ssp. *cruddasiana* is adventive in Dade Co., Florida and is apparently the species illustrated on page 1261 in Small's 1933 *Man. SE Flora*. *Paederia foetida* L. is adventive in Pasco, Hernando, and Volusia cos., Florida; Iberia Parish, Louisiana; and Harris Co., Texas.

Specimens collected: UNITED STATES. Texas: Harris Co., adventive vine climbing into trees at the end of Sage Rd. where it dead ends at Buffalo Bayou, N of Woodway Street, Houston, 8 Oct 1989, *Lowrey s.n.* and 14 Oct 1989, *Brown 14219* (SBSC, duplicates to be distributed to ASTC,SMU,TAES, and TEX).

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GYNODIOECY, ENDANGERMENT, AND STATUS OF *EREMALCHE KERNENSIS* (MALVACEAE)

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ABSTRACT

The relationships and status of *Eremalche kernensis* C. Wolf, an annual herb endemic of California, are considered. The new combination **E. parryi** (E. Greene) E. Greene ssp. **kernensis** (C. Wolf) D. Bates is made, and gynodioecy and endangerment of the subspecies is discussed. A revised description of *E. parryi* is given.

KEY WORDS: Malvaceae, *Eremalche*, gynodioecy, nomenclature, endangerment

The genus *Eremalche* was established by E.L. Greene (1906) to include three annual malvaceous species of the western United States and northwestern México. Two species, *E. rotundifolia* (A. Gray) E. Greene and *E. exilis* (A. Gray) E. Greene, are widespread in the Mojave and Sonoran deserts and somewhat beyond; the third species, *E. parryi* (E. Greene) E. Greene, occurs in central California in the foothills and valleys of the inner coast ranges and eastward to the Tehachapi Mountains and southern Sierra Nevada. A fourth species, *E. kernensis* C. Wolf, was described in 1938 from the southern San Joaquin Valley of California.

This note summarizes the principal points concerning the relationships of *Eremalche exilis, E. parryi*, and *E. kernensis*, with a focus on *E. kernensis*. *Eremalche rotundifolia* (Basionym: *Malvastrum rotundifolium* A. Gray), the lectotype species selected by Wiggins (1951), stands apart from the other taxa of the genus and is not further considered here.

In describing *Eremalche kernensis*, Wolf (1938) indicated that the species was narrowly endemic to Kern County, giving its range as the "Temblor Valley from near McKittrick to near Buttonwillow, apparently confined to an area a few miles wide and about fifteen miles in extent." Wolf noted morphological

similarities with both *E. exilis* and *E. parryi*. He distinguished *E. kernensis* from *E. exilis* by its larger flowers and presumably paler carpel color, and from *E. parryi* by pubescence, floral, and carpel characters, perhaps most notably its smaller white to pale lavender corollas.

Kearney (1956) observed that *Eremalche exilis, E. parryi*, and *E. kernensis* "seem to intergrade" and suggested that *E. kernensis* might have originated as a hybrid between *E. parryi* and *E. exilis*, a conclusion probably reinforced by the fact that the geographical range of *E. kernensis* lies more or less between that of the putative parents. In reference to collections of *E. kernensis* made by E.C. Twisselmann in the Temblor Valley, Kearney stated that they "show various combinations of the characters of *E. parryi, E. exilis*, and *E. kernensis*. Some of these are probably edaphic variants, as the habitat varied from dry sandy situations to clay-loam and more or less saline flats."

In 1961, while a graduate student at the University of California, Los Angeles, I made my first foray to the Buttonwillow and McKittrick region to collect *Eremalche kernensis*. Two impressions remain: the first was of the extreme aridity of the region; the second was the realization that *E. kernensis* is gynodioecious and that femaleness is linked to a reduction in corolla size. Gynodioecy in *E. kernensis* apparently has not been noted otherwise, except by Dean Taylor (pers. comm.), who has collected and made observations on the distribution, ecology, and morphology of *E. kernensis* and *E. parryi*. His field studies and my own, coupled with the observations of Twisselmann (1967), Hoover (1970), and Leonelli (1986), have also served to extend the range of *E. kernensis* westward from the type locality through the Temblor Mountains to the Carrizo Plain in San Luis Obispo County.

Morphological analyses of *Eremalche* by Leonelli (1986), my unpublished observations, and those of Taylor, reveal little overlap in character measurements between *E. kernensis* and *E. exilis*. *Eremalche exilis* differs from *E. kernensis* (and *E. parryi* in the broader sense) in its essentially prostrate habit; smaller, more rounded leaves; and uniformly small bisexual flowers, which are borne essentially within the leaves. Petal length measurements of *E. exilis* and *E. kernensis* overlap only when the female flowers, not the bisexual flowers, of *E. kernensis* are used in the comparison. Furthermore, I have seen no specimens that would confirm the reports of *E. exilis* in western Kern County (Twisselmann 1967) or San Luis Obispo County (Hoover 1970), localities that would presumably foster hybridization between *E. exilis* and *E. parryi*. I regard *E. exilis* as a Mojave and Sonoran desert species, not directly involved in the evolution of *E. kernensis*.

The morphological and geographical patterning of *Eremalche kernensis* and *E. parryi*, in contrast to that of *E. kernensis* and *E. exilis*, suggest a closer relationship. In vegetative characters, *E. kernensis* intergrades with the less robust plants of *E. parryi*. Individuals of *E. kernensis* with bisexual flowers tend to have smaller epicalyx bracts, calyces, and petals than *E. parryi*, but

proportionately the flowers are similar. Individuals of *E. kernensis* with female flowers have epicalyx bracts and calyces of essentially the same size as those of *E. kernensis* with bisexual flowers, but the petals are proportionately shorter and often barely exceed the calyx. *Eremalche parryi* and female plants of *E. kernensis* essentially share carpel numbers, 14 to 22 and 13 to 19, respectively; whereas, hermaphroditic *E. kernensis* has 9 to 13 carpels.

Viewed geographically, populations of plants with bisexual flowers, relatively large mauve corollas, and numerous carpels, *i.e.*, those typical of *Eremalche parryi*, are found from Alameda County in the San Francisco Bay area, southward to San Luis Obispo County and beyond; however, about the Carrizo Plain and at mid-elevations of the Temblor Mountains, gynodioecious populations with mauve corollas become increasingly common. Eastward and within what was initially considered the range of *E. kernensis*, gynodioecious populations are exclusive and white corollas are dominant. In these populations both female and bisexual flowers tend to have smaller flowers than the plants in the adjacent foothills.

The foregoing data suggest to me, as others have implied (Kearney 1956; Twisselmann 1967; Hoover 1970; Leonelli 1986), that *Eremalche kernensis* and *E. parryi* are elements of a single species complex, in which the eco-geographically defined pattern of morphological and sexual expression is best represented at the subspecific level. A revised description of *E. parryi* summarizing this conclusion follows.

Eremalche parryi (E. Greene) E. Greene

Annuals, leader more or less erect, 2-50 cm tall, unbranched or with ascending branches from the base, densely pubescent distally, hairs stellate and usually also 1-3 armed, arms to 2 mm long. Leaves mostly 2-5 cm wide, cleft to beyond the middle, lobes toothed to subcleft apically. Flowers generally exceeding the leaves, pedicels mostly 1-8 cm long, elongating in fruit; epicalyx bracts linear, (2.5-)4.0-10.(-15) mm long; calyx 4.5-13 mm long, lobes 3.2-11 mm long, 1.5-4.0 mm wide; petals (5.5-)6.0-20.(-25) mm long, white or pale to deep mauve; staminal column included. Mericarps 9-22, 1.5-1.8 mm high, more or less wedge shaped in cross section, brownish to blackish, margins rounded, cushionlike, radially corrugated. $2n = 20$.

Eremalche parryi (E. Greene) E. Greene ssp. *parryi*. BASIONYM: *Malvastrum parryi* E. Greene, *Flora Franciscana* 108. 1891. *Sphaeralcea parryi* (E. Greene) Jepson, *Manual Fl. Pl. Calif.* 633. 1925. TYPE: U.S.A. California: Monterey County, Salinas Valley, Apr 1888, *C.C. Parry s.n.* (LECTOTYPE: ND-G 031238). In describing *Malvastrum parryi*, Greene cited four specimens without designating the type. In

addition to the lectotype, chosen here, the collection of *J.G. Lemmon* (*s.n.*) taken in 1887 from San Luis Obispo County (ND-G 031240) is ssp. *parryi*; however, the *Parry* (*s.n.*) 1883 collection from Tulare (ND-G 031239) has floral measurements within the range of male fertile forms of ssp. *kernensis* but a carpel number (15) in the range of ssp. *parryi*. On the basis of the latter character expression it is retained in ssp. *parryi*. The fourth specimen, *State Survey 542* (UC) taken in 1861 from about Nacimiento River, a region within the range of ssp. *parryi* was not examined.

Plants with bisexual flowers. Flowering pedicels generally 2-8 cm long; epicalyx bracts 7.0-10.(-15) mm long; calyx 10-14 mm long, lobes 8.0-11 mm long, 2.5-4.0 mm wide; petals 15-25 mm long, mauve; mericarps 14-22. Alameda to Ventura and Kern counties: Interior valleys and foothills, 100-1300 m, inner and outer south coast ranges, central and southern Sierra Nevada, Tehachapi Mountain area, and western Transverse Ranges.

Eremalche parryi (E. Greene) E. Greene ssp. **kernensis** (C. Wolf) D. Bates, *comb. nov.* BASIONYM: *Eremalche kernensis* C. Wolf, Occas. Pap. Rancho Santa Ana Bot. Gard., ser. 1, 2:66. 1938. *Malvastrum kernensis* (C. Wolf) Munz, Aliso 4:93. 1958. TYPE: U.S.A. California: Kern County, Temblor Valley, 7 mi. northwest of McKittrick, on Lost Hills Road, 1 Apr 1937, *C.B. Wolf 8413* (RSA 18629).

Plants with either bisexual or female flowers. Flowering pedicels generally 1-5 cm long. Bisexual flowers: epicalyx bracts (3-)4-7(-10) mm long; calyx 5-9(-10) mm long, lobes 3.5-7.0(-8.0) mm long, 1.7-3.0(-3.5) mm wide; petals white or mauve, 8.0-20.(-25) mm long; mericarps 9-13. Female flowers: epicalyx bracts (2.5-)4.0-6.0(-8.0) mm long; calyx 4.5-7.5(-10.) mm long, lobes 3.2-6.5(-8.0) mm long, 1.5-2.5(-3.5) mm wide; petals white or mauve, 5.5-13. mm long; mericarps 13-19. San Luis Obispo and Kern counties: Eroded hillsides, alkali flats, 100-1000 m, southern inner coast ranges and southern San Joaquin Valley.

In addition to questions concerning its relationship to other taxa of *Eremalche* and its taxonomic status, *E. parryi* ssp. *kernensis* is of interest because of its sexual expression and because it is perceived to be endangered.

The majority of Malvaceae have hermaphroditic flowers, but there are exceptions. The Asiatic *Kydia calycina* Roxb., for example, is apparently monoecious. Dioecy characterizes species in such disparate genera as *Napaea*, *Sida*, *Cienfuegosia*, and those of the New Zealand and Australian *Plagianthus* alliance (Bates 1968; Fryxell 1979; Lander 1985). The Australian *Lawrencia glomerata* Hook. is polygamodioecious (Lander 1985). Gynodioecy prevails

in the North American *Callirhoe alcaeoides* (Michaux) A. Gray and *Sidalcea malvaeflora* (DC.) A. Gray *ex* Benth., among others, and in the Mexican *Cienfuegosia rosea* Fryxell (Dorr 1990; Fryxell 1979; Hitchcock & Kruckeberg 1957; Bates, unpublished). *Eremalche parryi* ssp. *kernensis* joins the gynodioecious group. In *Callirhoe alcaeoides* and *Sidalcea malvaeflora* femaleness is also linked to smaller corolla size, as it is in ssp. *kernensis*; however, no analysis of carpel numbers in relation to sexual expression has been made in either of these species.

In gynodioecious taxa femaleness generally is associated with increased fecundity as measured by greater seed set in female plants relative to that in hermaphrodites, or as seen in such factors as avoidance of inbreeding depression. Recent examples and discussion of gynodioecy are found in the work of Shykoff (1988) and Agren & Willson (1991). In *Eremalche parryi* ssp. *kernensis* the smaller petals and greater number of carpels in female flowers, relative to those of bisexual flowers, suggests that a greater percentage of reproductive resources is channeled to seed production, an interpretation in keeping with hypotheses concerning the evolution of gynodioecy (Charlesworth & Charlesworth 1978). It can be argued that the appearance of gynodioecy and presumed increased fecundity permitted *E. parryi* to invade or persist in the extreme aridity of the southern San Joaquin Valley and the adjacent foothills. Whatever the impetus for gynodioecy in *E. parryi*, however, it is not necessary to postulate an increase in carpel number in female flowers of ssp. *kernensis*, for they share with ssp. *parryi*, the presumed progenitor, essentially the same range of carpel numbers. Rather, it may be that bisexual flowers of ssp. *kernensis* have undergone a reduction in carpel number in order to allocate a greater percentage of reproductive resources to anther and pollen production.

The narrow endemism originally ascribed to *Eremalche parryi* ssp. *kernensis*, coupled with a paucity of early collections of the taxon, are suggestive of rarity and possible endangerment. The wider geographical range now attributed to the subspecies, however, implies a less threatened state, but that conclusion is questionable. Populations about the type locality, in which gynodioecy and white petal color are most strongly expressed, face a precarious future. The area has long been dotted with oil wells with their associated habitat disturbance, but the more recent widespread clearing of the scrub vegetation and resculpturing of the land for irrigated agricultural crops are far more extensive and serious problems. Populations occupying the foothills and valleys further removed from the floor of the southern San Joaquin Valley may escape the effect of land clearing but they remain vulnerable to grazing. It is clear that critical habitats of ssp. *kernensis* should be identified and preserved. Study and action, however, require perseverance because during dry years, plants of the subspecies may appear infrequently, if at all.

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I thank Dean Taylor for sharing with me his knowledge and collections of *Eremalche parryi* ssp. *kernensis*, Paul A. Fryxell, James C. Hickman, and Melissa Luckow for review of the manuscript, Dieter Wilken for searching the University of California–Berkeley herbaria, and Barbara J. Hellenthal for the loan of specimens from the University of Notre Dame.

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Phytologia (January 1992) 72(1):55-57.

A NEW SPECIES OF *VIGUIERA* (ASTERACEAE, HELIANTHEAE) FROM NAYARIT, MEXICO

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ABSTRACT

A new species, **Viguiera huajicoria** B. Turner from Nayarit, México is described. It is closely related to *V. latibracteata* and *V. grahamii*, but differs from both in having much smaller heads with fewer ray florets. A map showing the distribution of these three species is provided.

KEY WORDS: *Viguiera*, Asteraceae, Heliantheae, México

Routine identification of Mexican Asteraceae has revealed the following novelty.

Viguiera huajicoria B. Turner, *sp. nov.* TYPE: MEXICO. Nayarit: Mpio. de Huajicori, "2 km del Rancho de los Sauces," 5 Nov 1985, *I. Solis 556* (HOLOTYPE: TEX; Isotypes: CIIDIR).

Viguierae grahamii McVaugh similis sed foliis sparsim strigosis angustioribusque (2-5 mm latis vs. 8-30 mm), capitulis minoribus, et floribus radii paucioribus (5-8 vs. 11-21).

Much branched shrublet. Stems reddish-brown, sparsely strigose. Leaves alternate, linear-lanceolate, mostly 3-8 cm long, 2-5 mm wide; petioles 1-2 mm long; blades sparsely strigose above and below, more so above, the lower surfaces with a single principal nerve; the margins subentire. Heads numerous on ultimate, sparsely strigose peduncles 1-4 cm long. Involucres campanulate, 6-8 mm wide, 5-6 mm high; the bracts triseriate, subequal, with apices often reflexed, the outer bracts narrowly lanceolate, the middle and inner bracts ovate to elliptic obovate, minutely strigose. Receptacle convex, the pales 3-4 mm long, acute apically. Ray florets 5-8, neuter, sterile, the ligules yellow, 5-8 mm long, 3-4 mm wide, 6-8 nervate, the orifice of the tube with a tuft

Fig. 1. Distribution of Viguiera grahamii (open circle), V. huajicoria (open triangle) and V. latibracteata (closed circle).

of hairs. Disk florets mostly 30-50 per head; the corollas yellow, ca. 3 mm long, pubescent, the tube ca. 0.75 mm long, the throat ca. 1.5 mm long, the lobes deltoid, ca. 0.75 mm long. Anthers ca. 1.8 mm long. Achenes obovate, glabrous, ca. 2 mm long, epappose.

When first examined, I thought the above plant might be undescribed, but opted to think of it as a small headed collection of *Viguiera grahamii* McVaugh. The plant actually combines characters of the latter with characters of the closely related *V. latibracteata* (Hemsl.) S.F. Blake. It possesses the general habit and pubescence of the latter, but the leaf texture and venation of *V. grahamii*. It differs from both in having relatively smaller heads with fewer ray florets (mostly 5-8 vs. 11-21). The distributional relationships of these several species is shown in Fig. 1, based largely upon specimens at TEX.

In details of the disk florets, *Viguiera huajicoria* is remarkably similar to *V. latibracteata* and *V. grahamii*, and there can be little question but that these several taxa are closely related.

ACKNOWLEDGMENTS

I am grateful to Guy Nesom for the Latin diagnosis and to him and Jacqui Soule for reviewing the manuscript.

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TWO NEW SPECIES OF *ARENARIA* (CARYOPHYLLACEAE) FROM MEXICO

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ABSTRACT

Two new Mexican species of *Arenaria* are described and illustrated: **A. hintoniorum** B. Turner, a bizarre localized gypsophile from near Galeana, Nuevo León, and **A. tequilana** B. Turner from Volcán Tequila, Jalisco.

KEY WORDS: *Arenaria*, Caryophyllaceae, México

Routine identification of Mexican plants has revealed the following novelties.

Arenaria hintoniorum B. Turner, *sp. nov.* Fig. 1. TYPE: MEXICO. Nuevo León: Mpio. Galeana, W of San Roberto, gypsum hillsides, 2210 m, 14 May 1991, *G.B. Hinton et al. 20957* (HOLOTYPE: TEX).

Arenariae lycopodioidi Schlecht. similis sed differt caulibus strictis et foliis valde decussatis ciliatis succulentisque.

Perennial, stiffly erect, suffruticose herbs 3-10 cm high. Stems densely hispidulous with retrose hairs, the internodes short, mostly 1-5 mm long. Leaves opposite throughout, seemingly succulent, markedly decussate, linear-oblanceolate, semiplicate, those at midstem 3-4 mm long, 0.5-1.0 mm wide, hirsute-puberulous, especially along the margins, the apices acute to rounded, often apiculate. Flowers single, the peduncles 2-4 mm long. Sepals 5, elliptic, 2.5-3.5 mm long, pubescent like the leaves, the margins scarious. Petals 5, ovate, entire, white, 3-4 mm long, the apices broadly obtuse to rounded. Stamens 10, ca. 5 mm long, the anthers whitish-yellow, ca. 0.5 mm long. Styles 3, separate. Capsules (old and abortive) with 6 valves. Seeds not examined.

Fig. 1. Arenaria hintoniorum, from holotype.

This taxon is not like any other known to the present author. It appears to be a localized gypsum endemic, having a dwarf, suffruticose, subsucculent habit, with relationships to *Arenaria lycopodioides.*

Arenaria hintoniorum comes from an area where numerous localized, rather bizarre, gypsophilic endemics occur, many of these first collected by the remarkable Hinton family (cf. protologue of *Perymenium hintoniorum* B. Turner, Phytologia 71:315. 1991.).

Arenaria tequilana B. Turner, *sp. nov.* Fig. 2. TYPE: MEXICO. Jalisco: Top of Volcán Tequila, 14 Jan 1990, 2900 m, *M. Chazaro B. et al. 6176* (HOLOTYPE: TEX!; Isotypes: GUADA,WIS).

Arenariae lanuginosae (Michx.) Rohrb. similis sed differt floribus minoribus (2.5-3.0 mm longis) numerosioribusque in inflorescentia terminali cymosi-paniculata dispositis et seminibus cristis tuberculorum pusillorum distincte ornatis.

Perennial erect or sprawling herbs to 18 cm high. Stems pubescent in lines with minute recurved strigose hairs to glabrate. Leaves linear-lanceolate, mostly 8-22 mm long, 0.8-1.1 mm wide, uninervate, glabrous or ciliate at the base, the apices narrowly acute. Flowers numerous, arranged in terminal corymbose panicles, the ultimate slender peduncles mostly 5-15 mm long. Sepals 5, 2.5-3.0 mm long, ca. 1 mm wide, glabrous, weakly uninervate, somewhat purplish carinate, the apices acute. Petals 5, ovate, white, 2-3 mm long, the apices more or less lacerate or weakly lobed. Anthers 10. Ovary ovoid; styles 3, separate. Capsules ovoid, 6 valvate, the seeds black, subreniform, ca. 1 mm long, 0.8 mm wide, the dorsal margins with distinct ornamented ridges of low tuberculae, the lateral surfaces shiny and weakly ornamented.

ADDITIONAL SPECIMEN EXAMINED: MEXICO. Jalisco: "Volcán Tequila, along road to microwave station, oak forest interspersed with pine to 9000 ft (pines alone reaching top of plug at 9800 ft)" 23 Oct 1970, *Webster & Breckon 15840* (TEX).

Both of the above cited specimens note the species to be "abundant" or "common" near the top of the Tequila volcano. The type label describes the taxon as "annual" but the plant itself appears to possess slender, branched, rhizomes.

The numerous small flowers, arranged in an open cymose, bracteate, panicle readily distinguish this taxon from its presumptive closest relative, *Arenaria lanuginosa* ssp. *saxosa* (A. Gray) Maguire (*sensu* Maguire, Amer. Midland Naturalist 48:498. 1951.), a widespread and common taxon at lower elevations throughout most of México. The ornamented seeds of *A. tequilana*

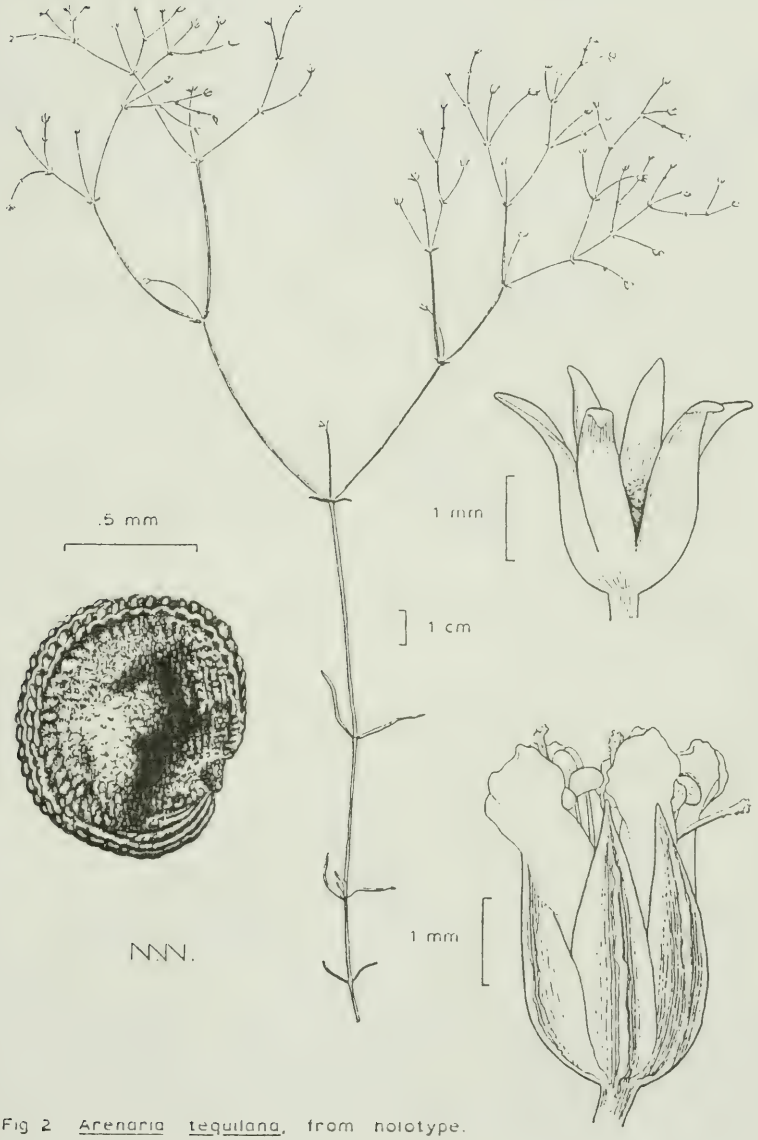

Fig 2 Arenaria tequilana, from holotype.

also distinguish the species from *A. lanuginosa*, which produces somewhat smaller, smooth seeds.

ACKNOWLEDGMENTS

I am grateful to Guy Nesom for the Latin diagnoses, and to him and T.P. Ramamoorthy for reviewing the manuscript. Nancy Webber provided the illustrations.

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NOTES ON *HELIANTHUS* (COMPOSITAE-HELIANTHEAE) FROM MEXICO[1]

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ABSTRACT

Nine of the 49 worldwide recognized species of *Helianthus* are registered from México. A first record of *Helianthus maximiliani* from México is reported. *Helianthus similis* is excluded from *Helianthus* to *Viguiera*. A key is provided for the Mexican species as well as notes on their distribution.

KEY WORDS: *Helianthus*, Heliantheae, Compositae, distribution, México

RESUMEN

De 49 especies de *Helianthus*, nueve se conocen de México, registrándose por primera vez para el país a *H. maximiliani*. *Helianthus similis* se excluye por pertenecer al género *Viguiera*. Se incluye una clave para la identificación de especies mexicanas y notas acerca de su distribución.

PALABRAS CLAVE: *Helianthus*, Heliantheae, Compositae, distribución, México

[1]Research supported by European Economic Community Contract No. TS2*-0231-I(A).

Wild species of *Helianthus* from México are currently under study for breeding systems. During the development of field collections and the revision of herbarium specimens for this purpose, we found nine species and five infraspecific taxa. *Helianthus maximiliani* Schrad. is reported for the first time from México. *Helianthus similis* (Brandegee) S.F. Blake is excluded from *Helianthus* and accepted as belonging in *Viguiera*. Heiser (1969) discussed the taxonomic position of this species and considered it much more closely related to *Viguiera* than to *Helianthus*, but retained it in the latter genus "only because technically it 'keys' to *Helianthus*" due to the deciduous pappus. We follow the criteria of Brandegee (1908) and Schilling & Heiser (1981) to exclude it from *Helianthus*.

DIAGNOSTIC KEY TO SPECIES FROM MEXICO

1. Leaves and stems appressed sericeous-villous; leaves whitish to grayish. ..... *H. niveus*

1. Not with the above combination of characters. 2

2. Annuals, sometimes from stout, woody taproots. 3

3. Phyllaries gradually attenuate; tips of central pales densely white bearded. ..... *H. petiolaris*

3. Phyllaries abruptly attenuate; tips of pales hispid or rarely glabrous, not densely white bearded. ..... *H. annuus*

2. Perennials. 4

4. Plants from taproots or horizontal pseudorhizomatous roots; lobes of disk corolla red or yellow. 5

5. Roots stout; base of old stem with buds; leaves short petiolate; plants known from northern Baja California. ..... *H. gracilentus*

5. Roots slender, horizontal; leaves sessile or subsessile; more widely distributed plants. 6

6. Stems glaucous, glabrous or with scattered hairs; pappus of two ovate to ovate-lanceolate scales. .. *H. ciliaris*

6. Stems green, rarely somewhat glaucous, subglabrous to strigose or hispid; pappus of two to five linear to lanceolate scales. ..... *H. laciniatus*

4. Plants from rhizomes, tubers or crown buds; disk corolla entirely yellow. 7

7. Stems glabrous, glaucous; phyllaries broadly lanceolate, 3-5 mm wide. ..... *H. californicus*

7. Stems scabrous to densely hirsutous; phyllaries linear-lanceolate, 1.5-3.0(-3.5) mm wide. 8

8. Leaves mostly opposite; phyllaries 2.0-3.0(-3.5) mm wide, short attenuate, equaling or slightly exceeding the disk. ..... *H. hirsutus*

8. Leaves mostly alternate; phyllaries 1.5-2.5 mm wide, long attenuate, conspicuously exceeding disk. ..... *H. maximiliani*

Using the infrageneric classification proposed by Schilling & Heiser (1981), the Mexican species are grouped as follows:

Sect. *Helianthus*: *H. annuus*, *H. niveus*, and *H. petiolaris*.

Sect. *Ciliares*.

Ser. *Ciliares*: *H. ciliaris* and *H. laciniatus*.

Ser. *Pumili*: *H. gracilentus*.

Sect. *Divaricati*.

Ser. *Corona-solis*: *H. californicus*, *H. hirsutus*, and *H. maximiliani*.

Helianthus annuus L., *Sp. Pl.* 906. 1753.

Distribution: Widely distributed from Canada to México. In México: Northern part of the country and the Atlantic coast to Yucatán. Scarce in the central highlands. From sea level up to 2000 m, especially in disturbed habitats in xerophytic, halophytic, temperate, and tropical vegetation. Rzedowski (1985) mentioned that wild forms of this species are recently introduced in the Valley of México. Fig. 1.

Selected specimens: Baja California: *I.L. Wiggins & J. Thomas 427* (MEXU). Baja California Sur: *C. Rodríguez 1743* (ENCB,MEXU,CIIDIR). Sonora: *R.S. Felger 86-396* (MEXU). Sinaloa: *M. Medina 1986* (ENCB, MEXU). Durango: *D. Gómez 27* (CIIDIR). Chihuahua: *D. Gómez 31* (CIIDIR). Coahuila: *D. Gómez 1-a* (CIIDIR). Nuevo León: *A.M. Pascoe 262* (ENCB). Tamaulipas: *F. González M. 12992* (MEXU). Veracruz: *G. Ibarra 2897* (MEXU). Campeche: *E. Cabrera 2344* (MEXU). Yucatán: *E. Cabrera y H. de Cabrera 11311* (MEXU).

Helianthus annuus is extremely variable and the infraspecific taxa, as treated by Heiser (1969), are frequently distinguished only with difficulty. In addition, natural hybridization occurs with several species. Hybrids between *H.*

Fig. 1
• Helianthus annuus

Fig. 2
• Helianthus laciniatus.
• Helianthus ciliaris

annuus and *H. petiolaris* are known from northern México (*e.g.*, *Gómez 59*, CIIDIR,TEX).

Vernacular names: girasol, gordolobo (S.L.P.), mirasol de monte (Camp.), polocote (Tam.), and sanchín (S.L.P.); maíz de Texas (cultivated plants).

Helianthus niveus (Benth.) Brandegee, Proc. Calif. Acad. II. 2:173. 1889.

Distribution: Southern California and Arizona to Baja California and Sonora. Sea level up to 300 m, on sandy dunes and halophytic or xerophytic scrub. Fig. 3.

Both subspecies of this species are found in México:

Helianthus niveus ssp. *niveus*. Endemic to Baja California.

Selected specimens: Baja California: *D. Gómez 69* (CIIDIR). Baja California Sur: *E. Palmer 826* (MEXU).

Helianthus niveus ssp. *tephrodes* (A. Gray) Heiser *et al.*, Mem. Torrey Bot. Club 22:43. 1969. Southern California and Arizona to western Sonora.

Selected specimens: Sonora: *D. Gómez y S. Medina 39, 70, and 72* (CIIDIR).

Helianthus petiolaris Nutt., Jour. Acad. Sci. Phil. 2:115. 1821.

Distribution: Southern Canada to northern México. 400-2700 m, especially on sandy soils. Fig. 5.

All the varieties are present in México, although frequently they are not clearly distinguished *i.e.*, specimens with phyllaries wider than 4 mm (as in var. *petiolaris*) and with peduncles with leafy bracts subtending the head (as in var. *fallax*).

Helianthus petiolaris var. *petiolaris*. Southern Canada to Sonora and Chihuahua.

Selected specimens: Sonora: *R.S. Felger 16860* (MEXU). Chihuahua: *D. Gómez 64* (CIIDIR,TEX).

Helianthus petiolaris var. *fallax* Heiser. Colorado and Utah to northern México.

Selected specimens: Sonora: *D. Gómez 54* (CIIDIR). Chihuahua: *D. Gómez 51* (CIIDIR).

Helianthus petiolaris var. *canescens* A. Gray. Southwestern United States and northern México.

Selected specimens: Sonora: *A.C. Sanders et al. 3482* (MEXU). Chihuahua: *R. Bye 8593* (MEXU).

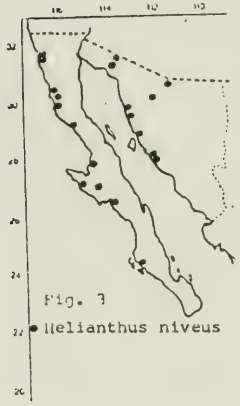

Fig. 3
• Helianthus niveus

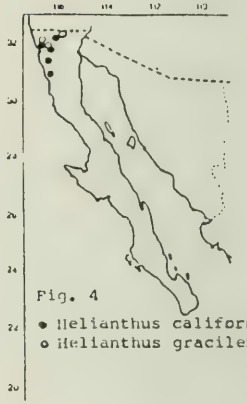

Fig. 4
• Helianthus californicus
o Helianthus gracilentus

Fig. 5
• Helianthus petiolaris
o Helianthus hirsutus
• Helianthus maximiliani

Helianthus ciliaris DC., *Prod.* 5:587. 1836.

Distribution: United States to México. In México: Sonora to Tamaulipas and San Luis Potosí. 1100-2600 m. Fig. 2.

Selected specimens: Sonora: *R.M. Straw 1590* (ENCB). Chihuahua: *J. Rzedowski 27352* (ENCB). Durango: *D.M. Spooner & E. Schilling 2460* (MEXU). Coahuila: *I.K. Langman 3954* (MEXU).

Helianthus laciniatus A. Gray, Mem. Amer. Acad. 4:84. 1849.

Distribution: New Mexico to central México. Common on the Mexican Tableland between 600 and 2300 m in xerophytic scrub and grasslands. Fig. 2.

Selected specimens: Chihuahua: *J. García 746* (CIIDIR). Durango: *D. Gómez 61* (CIIDIR). Coahuila: *E. Palmer 12* (MEXU). Nuevo León: *Hinton et al. 17124* (ENCB). San Luis Potosí: *J. Rzedowski 7646* (ENCB). Guanajuato: *J. Kishler 989* (MEXU). Querétaro: *E. Arguelles 1139* (MEXU). Federal District: *J. Rzedowski 26035* (ENCB,MEXU). México (state): *J. Rzedowski 20230* (ENCB).

This is a polymorphic species. *Helianthus dissectifolius* R. Jackson is a form with deeply dissected leaves.

Vernacular name: jurica (Querétaro).

Helianthus gracilentus A. Gray, Proc. Amer. Acad. Arts 11:77. 1876.

Distribution: California to northern Baja California, on western slopes up to 1300 m, in scrub or dry forests. Fig. 4.

Selected specimen: Baja California: *D. Gómez 66* (CIIDIR).

Helianthus hirsutus Raf., Ann. Nat., p. 14. 1820.

Distribution: Eastern United States to Coahuila and Nuevo León. Very scarce in México. Fig. 5.

Selected specimens: Coahuila: *T. Wendt et al. 1259* (MEXU). Nuevo León: *C.H. & M.T. Muller 245* (MEXU).

Helianthus californicus DC., *Prod.* 5:589. 1836.

Distribution: California and Northern Baja California. Fig. 4.

Selected specimens: Baja California: *H. Bravo 9200* (MEXU).

Helianthus maximiliani Schrader, Ind. Sem. Hort. Gotting. 1835.

Distribution: Previously known from southern Canada to southern United States. In México was found growing as a weed in a yard: Chihuahua: Buenaventura, casa Fam. Vega Gaytán, 1380 m.s.n.m., 25.IX.1991, planta de 2.5 m, con rizómas, *D. Gómez 83* (CIIDIR,TEX,dupl. to be distributed). In cultivation this species has been collected from: Coahuila: Palaú, salida a Barroterán, en jardín, 400 m.s.n.m., 13.X.1991, planta de 1.6 m, *D. Gómez 83* (CIIDIR, duplicates to be distributed). Fig. 5.

This material appears to fall within the confines of *Helianthus maximiliani* as treated by Heiser (1969), except in the character of conduplicate leaves. Heiser comments that this species has long been appreciated as a garden ornamental. Probably the plants from Chihuahua are escaped from cultivation, since apparently there are not wild plants of this species in the area.

Helianthus aff. *strumosus* L. and *H. tuberosus* L. are names on missidentified herbarium specimens. The presence of these species in México is doubtful, but possible that further collecting efforts will allow us to find these or other species.

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Phytologia (January 1992) 72(1):71-75.

BOOKS RECEIVED

Annual Review of Ecology and Systematics. Vol. 22. Richard F. Johnston, Peter W. Frank, & Frances C. James (eds.). Annual Reviews Inc., 1139 El Camino Way, Palo Alto, California 94306. 1991. xii. 621 pp. $40.00 (cloth). ISSN 0066-4162. ISBN 0-8243-1422-0.

The current volume of this series is dedicated to one of the founding editors of "Annual Review of Ecology and Systematics," Dr. Charles D. Michener, who retired last year. A total of 43 authors have contributed 23 papers to this volume. Topics reviewed include evolutionary rates, ecology of parapatry, plant mate choice, canalization, herbicide resistance in weeds, guilds, ecology of lemurs, treeline, vertebrate physiological differentiation, evolutionary novelties, nitrogen loading, molecular speciation, branch autonomy, spatial genetic variation in plants, bird migration, marmot social and population structure, clutch size, interactions between browsers and woody plants, systematics of Drosophilidae, effects of herbivores on communities and ecosystems, endangered species management, molecular systematics of fungi, and systematics and evolution of spiders. This volume continues the tradition of this valuable series.

Introduction to the Principles of Plant Taxonomy, second edition. V.V. Sivarajan (edited by N.K.B. Robson). Cambridge University Press, 40 West 20th Street, New York, New York 10011. 1991. xiv. 292 pp. $29.95 (paper), $79.95 (hardcover). ISBN 0-521-35679-2 (paper), 0-521-35587-7 (hardcover).

This book is as much a critique of plant taxonomy as it is an introduction to the field. As such, it is a useful tool in providing insight on how taxonomists perform their work. However, its usefulness is likely to be greatest for individuals who already have considerable familiarity with plant taxonomic principles. Written by an author with a viewpoint other than the typical "Western" concept of taxonomy (or science for that matter), this is certainly not a mainstream text, and will probably be poorly received in many quarters. On the other hand, because of the different points of view expressed in the book, it should stimulate discussion and may result in advances in the discipline. At the very least, some of the points raised by Sivarajan may prompt a critical self examination of what we as taxonomists/systematists do, and how we go about our work.

Islands, Plants, and Polynesians, An Introduction to Polynesian Ethnobotany. Paul Alan Cox & Sandra Anne Banack (eds.). Dioscorides Press, 9999 S.W. Wilshire, Suite 124, Portland, Oregon 97225. 1991. 228 pp. $34.95 (cloth). ISBN 0-931146-18-6.

This book is a summary of ethnobotanical information on the Polynesian peoples. Possibly the greatest significance of this work will be its use as a standard with which to compare other ethnobotanical studies. This possibility exists because of the circumstances under which scientists have been able to study Polynesian ethnobotany. Since Polynesians travelled from island to island and the islands that they inhabited were previously not colonized by humans, the colonizations have taken place relatively recently (within the past several thousand years), and the Polynesians lived in virtual isolation from other humans until relatively recently, ethnobotanical influences of Polynesians are more easily (compared to Incas, Phoenicians, etc.) examined in isolation from other human influences. Ten chapters were contributed by ten different authors, each examining a particular facet of Polynesian ethnobotany. This book is likely to be a standard on the subject for some time.

Jurassic and Cretaceous Floras and Climates of the Earth. V.A. Vakhrameev. Translation from 1988 Russian edition by Ju. V. Litvinov. Norman F. Hughes (ed.). Cambridge University Press, 40 West 20th Street, New York, New York 10011. 1991. xix. 318 pp. $99.50 (cloth). ISBN 0-521-40291-3.

Vakhrameev has summarized the geologic and fossil data for the Jurassic and Cretaceous Periods. His treatment deals primarily with data from Eurasia (and in particular, the Siberian region), with generally more concise summaries relating to other parts of the world. While this fact appears as a limitation for the work, it is the book's greatest asset, since data from Asia and eastern Europe has been extremely difficult to obtain. Thus, this book includes considerable data heretofore unavailable to paleobotanists in most of the world. In conjunction with Western works of similar scope, covering the same geologic time periods, one can obtain a reasonably complete summary of fossil floras of the time. Summaries of the fossil floras are organized into geologic time segments, and within these, fossil floristic regions and provinces are delimited. In addition to the text and data tables, a number of maps and photographs of fossils are included. The book would appear to be very useful to anyone dealing with world vegetation patterns during the Jurassic and/or Cretaceous.

Phytophthora. J.A. Lucas, R.C. Shattock, D.S. Shaw, & Louise R. Cooke (eds.). Symposium of the British Mycological Society, the British Society for Plant Pathology, and the Society of Irish Plant Pathologists held at Trinity College, Dublin, September 1989. Published for the British Mycological Society by Cambridge University Press, 40 West 20th Street, New York, New York 10011. 1991. xiv. 447 pp. $110.00 (hardcover). ISBN 0-521-40080-5.

The book consists of papers from a symposium organized to commemorate the centennial of the death of Miles Joseph Berkeley. Berkeley was a "naturalist" (mycologist, botanist, algologist, invertebrate zoologist, clergyman), probably best known (at least for the subject of this book) for his assertion that the late potato blight which devastated potato crops in the middle 1840s (producing famines in Ireland, resulting in large influxes of Irish to the United States) was caused by a fungus. A total of 28 papers are included in this book, contributed by 51 authors. The

authors are primarily European, with a smattering of individuals from other parts of the world. The various articles treat topics ranging through host-pathogen interactions (several papers), systematics of *Phytophthora* (several papers), pathogen dispersal, genetics and reproduction of *Phytophthora*, various pathogen control mechanisms, and prospects for future work to lessen impact of *Phytophthora* on crop plants (potato and others).

Plant Growth: Interactions with Nutrition and Environment. J.R. Porter & D.W. Lawlor (eds.). Vol. 43, in Society for Experimental Biology Seminar Series. Cambridge University Press, 40 West 20th Street, New York, New York 10011. 1991. xii. 284 pp. $79.50 (hardcover). ISBN 0-521-36133-8.

Sixteen authors have contributed a total of eleven papers to this volume. While primarily physiological in orientation, the topics treated range from subcellular processing of various nutrients to interactions between plants and their nutrient supplies at the population or ecosystem level. Some papers are very narrow in their view of nutrient processing, treating a limited number of nutrients involved in specific aspects of plant metabolism. Other papers examine broader physiological and/or ecological consequences of availability of one or two nutrients. Such breadth of treatment has in the past been unusual for specialized books of this type. A broadening of scope, with the associated attempt to view the "big picture," is refreshing, and may be an indication of the maturation of the biological sciences.

The Preservation and Valuation of Biological Resources. Gordon H. Orians, Gardner M. Brown, Jr., William E. Kunin, & Joseph E. Swierzbinski (eds.). Proceedings of an Interdisciplinary Workshop, 12-16 June 1985. University of Washington Press, P.O. Box 50096, Seattle, Washington 98145-5096. 1991. x. 303 pp. $40.00 (cloth). ISBN 0-295-97004-9.

This book summarizes discussions on a number of issues relating to potential loss of a significant portion of the earth's biodiversity. Six topic areas (*ex situ* conservation of germ plasm, *in situ* conservation of germ plasm, how to measure genetic uniqueness, how to measure ecological uniqueness, how to measure value of

genetic resources, and prospects of market incentives to conserve biodiversity) were chosen by the organizers of this symposium and papers, each written by one or two authors, prepared to treat these six subjects. Each paper was examined and written commentary prepared, by two additional individuals with an interest in the particular subject areas. Papers and commentaries were sent to participants of the symposium so that the papers could be read before the symposium took place. The meeting itself consisted of a discussion of the papers, commentaries, and related issues. The present volume contains the written papers and commentaries, along with a summary of the discussions that took place during the meeting. In this time of increased danger of major losses of biodiversity from Earth, this book would seem to be a good starting point from which to begin to address means of preventing such losses.

Wild India The Wildlife and Scenery of India and Nepal. Photographs by Gerald Cubitt. Text by Guy Mountfort. The MIT Press, 55 Hayward Street, Cambridge, Massachusetts 02142. 1991. 208 pp. $39.95 (hardcover). ISBN 0-262-13276-1.

This is primarily a book of beautiful photographs from a land of stunning views. Some text is included in the book, and therein are descriptions of geography and climate, vegetation, wildlife, and pressures exerted by an increasing human population. A very useful map of National Parks and Sanctuaries is also included. Unlike many books published to portray the natural beauties of an area, this one contains relatively few landscape photographs, but instead concentrates on individual organisms. While the majority of pictures are of mammals, birds, and reptiles, plants are well represented. The book consists of four major parts. The first contains most of the textual material, the other three treating major physiographic provinces on the subcontinent (The Himalayas, The Indo-Gangetic Plain, and The Deccan). The large format (25.5 x 34 cm) allows inclusion of extra large photographs.

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Information for Authors

Articles from botanical systematics and ecology, including biographical sketches, critical reviews, and summaries of literature will be considered for publication in PHYTOLOGIA. Manuscripts may be submitted either on computer diskette, or as typescript. Diskettes will be returned to authors after action has been taken on the manuscript. Diskettes may be 5.25 inches or 3.5 inches and may be written in any IBM or MacIntosh compatible format. Typescript manuscripts should be single spaced and will be read into the computer using a page scanner. The scanner will read standard typewriter fonts but will not read dot matrix print. Manuscripts submitted in dot matrix print cannot be accepted. Use underscore (not italics) for scientific names. Corrections made on typescript manuscripts must be complete and neat as the scanner will not read them otherwise. Language of manuscripts may be either English or Spanish. Figures will be reduced to fit within limits of text pages and therefore, should be submitted with an internal scale and have dimensions proportional to those for text pages. Legends for figures should be included in figures whenever possible. Each manuscript should have an abstract and key word list. Specimen citations should be consistent throughout the manuscript. Serial titles should be cited with abbreviations used in *Botanico Periodicum Huntianum*. References cited only as part of nomenclatural summaries should not appear in Literature Cited. Nomenclatural work should include one paragraph per basionym and must provide proper (as defined by the current *International Code of Botanical Nomenclature)* citation of sources of epithets and combinations.

Authors should arrange for two workers in the appropriate field to review the manuscript before submission. Copies of reviews should be forwarded to the editor with the manuscript. Manuscripts will not be published without review.

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